FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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## Flight.

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## EDITORIAL COMMENT.

**The Invention and Research Board.**

When the Government announcement was originally made that it had been determined to establish an Admiralty Board of Invention and Research, it was patent to everyone that the lot of those appointed to carry out the duties of this department would have a pretty lively time at the offset. It required no very vivid imagination to picture the avalanche of disappointed inventors and cranks who would forthwith hail this new Government sorting out office as the one thing they had been waiting for to obtain recognition of their revolutionary inventions which would at once set everything right which hitherto had been wrong. And so it has come about quite naturally that schemes of the maddest description, ideas with germs of possibility in them and others have been piled up for ultimate investigation and consideration by a body of experts, second probably to none in the world. Here and there a leavening of hopeless crankiness must necessarily emerge from practical sound inventions which are being submitted, and the ultimate good which may accrue to the Nation should well repay the laborious initial stages of investigation of the thousands of ideas brought to the notice of the Inventions Board. To the uninitiated it is difficult to convey any notion of what a ghastly business this first investigation is in practice, and when the history of this new department comes to be written—if it ever is—there should be good ground for according the Nation's unstinted gratitude to those men who have taken upon themselves the onus of giving a hearing to all and sundry inventors who are each individually convinced that they and they alone possess the key to the solution of some evil or difficulty which their particular invention is designed to remedy.

In one respect we are glad to support the activities of such an official body, as with so young a science as aviation there is such a vast field open for the sane inventor—if not in main principles, at least in minor details, which in themselves may have the most important and far-reaching consequences. No doubt most of our chances in this direction will be for the time in abeyance, by reason of our best talents being already fully occupied with the very material work entailed by definite Government orders for machines, engines and parts of either or both. But we can hardly think, even then, that there will not be feasible propositions put forward, likely to be helpful in bringing about the gradual perfection in refinements and methods which cannot result other than beneficially to the science as a whole. We therefore welcome the particulars available of the dividing up of the labour, for which the Central Committee of twelve with Lord Fisher as its President is responsible, by the appointment of a number of permanent sub-committees. By this de-centralisation, the close investigation which many inventions and schemes must entail will be greatly eased by each Section having attached to it particular experts prominent in the respective branches of science which will come within the scope of each respective Section. This should not only ensure the maximun of efficiency in coming to a decision in regard to any ideas put forward, but should give confidence to the many whose one complaint as a rule is that they have not had a fair or proper hearing or consideration by the right or a competent man. The names of those who will be judges of what is good, bad or indifferent should carry such weight as to stifle any discontent even in the most hardened of veterans in the service of their own inventions, although we should like very much to have seen more aeronautical men—and practical business men at that—included on the committees. What position aircraft occupies in the minds of the Board is, we think, reflected in the fact that Section I embraces airships, aeroplanes and seaplanes—a preferential position which we not

unnaturally think is well deserved. There is certainly greater scope in the navigation of the air for brain-waves than probably in any other branch of science. Its youth has been so strong in its growth as to have almost run away from a host of slow but sound thinkers who may now have the opportunity of their lifetime to obtain demonstration of the practicability of their ideas. On this Section are included as members Professor the Hon. R. J. Strutt, Dr. R. T. Glazebrook, Mr. F. W. Lanchester, Mr. R. Threlfall and Mr. H. T. Wright. Section II does not so much concern the science of aviation directly, although in its practical association with air-work, its importance to the development of aviation in the direction of general utility cannot be over-rated. Section II embraces submarines, mines, searchlights, wireless telegraphy, general electrical, and electro-magnetic subjects, &c., this sub-committee including the Duke of Buccleuch, Professor W. H. Bragg, Mr. W. Duddell, Professor Sir E. Rutherford, Dr. R. T. Glazebrook, and Mr. C. H. Merz, Section III has four sub-committees allotted to it, these dealing respectively with naval construction, marine engineering, internal combustion engines, and oil fuel. Here again aviation is keenly interested most directly in at least one division, viz., internal combustion engines. In this the committee is composed of Commander the Marquis of Graham, Professor Bernard Hopkinson, Mr. A. E. L. Chorlton, Mr. R. P. Doxford, Mr. Summers Hunter, and Mr. F. W. Lanchester. For oil fuel, in which aviation is not unconcerned ultimately, the selection is the Marquis of Graham, Sir Oliver Lodge, and Sir Boverton Redwood. No less important, perhaps, to the country is the scope of Section IV., which has in its charge matters relating to anti-aircraft apparatus of every description. Over this Admiral Sir Percy M. Scott, Professor Sir W. Crookes and Professor N. F. Newell exercise control, and it is to be hoped that this sub-committee has already got good work in, as no better time could be sought than the present to put to effective test any device or method designed to nullify the effects of attacks from the air. Even Section V—Ordnance and Ammunition—cannot be said to be very wide of aviation interests, although this section in practice would no doubt be subservient, so far as concerns air-work, to the last section, No. VI, which has within its terms of reference the armament of aircraft, bombs and bomb-sights. Professor B. Hopkinson, Admiral Sir Percy Scott, and Mr. R. Threlfall constitute the executive of this very important committee, whilst those attached to the Ordnance and Ammunition Committee of Section V are Admiral Sir Percy Scott, Professor H. C. H. Carpenter, Rear-Admiral Sir Sidney Eardley-Wilmot, Mr. G. G. Millstrom, Mr. R. Redpath, and Mr. C. Wale. This Section has also other sub-committees for handling (a) explosives, consisting of Professor Sir William Crookes and Professors H. B. Baker and W. J. Pope; (b) Noxious gases, in charge of Professors H. B. Baker, H. C. H. Carpenter and P. F. Frankland; (c) Raw materials for explosives, with Professors P. F. Frankland, W. J. Pope and M. O. Foster as its members.

Altogether a very convincing list of technical men who will without question be able to give presently a good account of their stewardship. One name which is very familiar in the aviation world remains to be mentioned, viz., that of Flight-Commander Lord Edward Grosvenor, who is the technical Secretary to Section VI of the Board, each of the other Sections having in like manner a technical Secretary attached to it.

Already this body of men are well into their work, and we wish them every success, in helping to promote by their research efforts, that final peace to which the whole civilised world looks forward. May it come a little earlier through their helpful work, than even the most optimistic amongst us hope for.

* * *

**And a Contrast.**

By way of the opposite of all that can be commended, is the extraordinary persistence of those interested in the concern which has taken unto itself the very ambitious title of "The Aeronautical Institute of Great Britain." When this so-called "institute" was brought into the world some few weeks ago, we recorded the inaugural date of its "birth" in such manner as to convey to all those who have any judgment of their own, our opinion of its merits. We hardly conceived that anybody could take the scheme seriously, having regard to the already existing and long-tried bodies in power in the World of Aviation. And so we left the whole business to come by its end in a nice quiet natural way. It would appear, however, as if there were still an inclination to proceed with the attempt to force this "institute" upon an unwilling and unsympathetic world, judging by certain communications which reached this office last week. The first was a remarkable "manifesto" sent round generally to the Press, the contents of which were as follows:—

"When the First Lord of the Admiralty declared in the House of Commons on the 11th inst. that 'We are making aeroplanes as hard as we can . . . . We are behindhand. We have always been behindhand in this war,' he drew public attention to a serious situation which had already been foreseen by the promoters of a meeting of influential people held at the Royal Society of Arts and Manufactures, under the chairmanship of Sir William M. Ramsay, on September 30th. At that meeting it was decided to appoint an Aeronautical Production Committee, which would do its utmost to remove whatever might be impeding the country's maximum output of aircraft.

"After closely investigating the causes at present retarding production, this Committee has now evolved adequate methods whereby it can help to speed up the production of aircraft to the highest point and is ready to commence its work.

"It is extremely important for the public to realise that a greater increase in rate of production than now obtains can be achieved only by adequate organisation in directions beyond the sphere of the great aeronautical work which is being actually carried on by the Government.

"With the assistance of scientific, industrial, and financial experts, the Aeronautical Production Committee, by concentrating its activities on the ground not covered by the Government, will help the aeronautical industry to produce with much greater rapidity.

"To run the whole work of organisation with full effect the committee requires £5,000—less than the price of three aeroplanes. This relatively small sum, spent in the proper way, in the directions indicated above, will have a far-reaching influence on the duration of the war.

"The Executive Committee of the Aeronautical Institute of Great Britain, on which the Aeronautical Committee depends, therefore feels justified in asking for the support of the public. To make up the amount required for this work, the committee invites 5,000 suitable persons to become members of the Institute, at a subscription of one guinea each, or a smaller number to make donations.

"The Institute is equally a scientific and technical, an educational and patriotic organisation—as such, open to the public in general and the aeronautical world in particular. Its address is temporarily at 39, Victoria Street, Westminster, S.W., where all enquiries will be answered.

"The great urgency of the matter demands prompt action.

"The Committee, therefore, confidently asks for the immediate support of the public.

(Signed) "CHARLES BRIGHT, F.R.S.E., &c.
"GEORGE GREENHILL, F.R.S.
"F. N. MAUDE, Col., C.B.
"L. BLIN DESBLEDS."

The transparent absurdity of this appeal and the bald way in which the public were asked to find the funds for carrying on this very undefined scheme of helping the Nation, were so utterly childlike and unconvincing, that

BEHIND THE FIRING LINE IN FRANCE.—A scene on one of the great roads, with one of the British aeroplanes just starting out to make a reconnaissance. From an original drawing by Lieut. Roderic Hill.

we hardly thought it worth while expounding our views upon it in this direction. Unfortunately in several newspapers, the appeal received hospitality, without comment, owing no doubt to the names which were associated with the "manifesto." We hardly think, even so, that any substantial response is likely to accrue, as we credit the great "B.P." with more sense than to accept, as a thing of substance worthy of National support, so vague a proposition. We did, however, insert an official disclaimer from Professor G. H. Bryan, F.R.S., of any further association with the "Institute," and we had hoped to have received further communications of a like nature from most of the prominent and responsible men, in view of the nature of the appeal given above, whose names have already been put forward as directly interested in the "Institute's" foundation and welfare. None, however, have come to hand. On the contrary, a further *communiqué* was offered us from the "Aeronautical Production Committee" of this "Institute" setting forth the following highly suggestive

ANNOUNCEMENT.

"The following eminent French aeronautical experts have expressed their desire to give the benefit of their active co-operation to the Aeronautical Production Committee of the Aeronautical Institute of Great Britain, with a view to assisting their British colleagues in their efforts to speed up aircraft production to a *maximum maximorum*:—

"M. Gustave Eiffel, engineer, of Eiffel Tower fame (Officer Legion of Honour, Founder and Director of Eiffel's Aerodynamical Laboratory; Past President of the Society of Civil Engineers of France).

"Prof. Lucien Marchis (Prof. at the Sorbonne; Prof. of Aviation at the Faculty of Sciences of Paris).

"Prof. Lecornu (of the 'Institut,' member of the 'Academie des Sciences,' Prof. at the 'Ecole Polytechnique' and at the School of Mines).

"Commandant Roche (Director of the 'Ecole superieure d'Aéronautique et de Construction Mécanique.')

"L. BLIN DESBLEDS,
"On behalf of the Executive Committee."

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## The Destruction of the "Königsberg."

ATTACHED to the despatch, dealing with the destruction of the "Königsberg," of Vice-Admiral H. King-Hall, Commander-in-Chief, Cape of Good Hope Station, dated July 15th, and published in a supplement to the *London Gazette*, issued on December 8th, there was the following:—

"I have much pleasure in bringing to the notice of their Lordships the names of the following officers and men:—

"Squadron-Commander Robert Gordon, in command of the Air Squadron; Flight-Commander John T. Cull; Flight Lieut. Vivian G. Blackburn; Flight Sub-Lieut. Harwood J. Arnold; Flight Lieut. Harold E. M. Watkins.

"Assistant Paymaster Harold G. Badger, H.M.S. 'Hyacinth.' This officer volunteered to observe during the first attack on the 'Königsberg,' though he had had no previous experience of flying.

"Acting Lieutenant Alan G. Bishop, Royal Marine Light Infantry, of H.M.S. 'Hyacinth.' This officer volunteered to observe during the second attack on the 'Königsberg,' though he had had no previous experience of flying.

"Air-Mechanic Ebenezer Henry Alexander Boggis, who went up on April 25th with Flight-Commander Cull, and photographed the 'Königsberg' at a height of 700 ft. They were heavily fired on, and the engine of the machine was badly damaged.

"Most serious risks have been run by the officers and men who have flown in this climate, where the effect of the atmosphere and the extreme heat of the sun are quite unknown to those whose flying experience is limited to moderate climates. 'Bumps' of 250 feet have been experienced several times, and the temperature varies from extreme cold when flying at a height to a great heat, with burning, tropical sun, when on land. In the operations against the 'Königsberg' on July 6th both *personnel* and *matériel* of the Royal Naval Air Service were worked to the extreme limit of endurance. The total distance covered by the two available aeroplanes on that date was no less than 950 miles, and the time in the air, working watch and watch, was 13 hours.

We can only accept the information contained in the above at the value of its literal phraseology, but what the real worth of this suggested co-operation may be is best, we think, expressed as "X" value. No doubt these eminent French scientists have taken a good deal for granted when authorising the above "announcement," but we have grave doubts as to whether active co-operation is indeed intended on their part, having regard to the loose interpretation which is put upon the results of interviews with other men of moment, who are put forward as being in accord with the objects of the "manifesto" to which we give prominence on p. 958. In this connection in a covering letter signed "on behalf of the Executive Committee" by Mr. L. Blin Desbleds, one of the Executive Committee, which was sent out with this "manifesto," asking for its publication, the following paragraph occurs:—

"The wording of the 'manifesto' is in strict accordance with the views of the heads of the military and naval air services, as expressed by them in personal interviews."

Frankly, we entirely doubt that this paragraph is any way justified as a result of any interviews with the "heads of the military and naval air services." We fancy that nobody will be more surprised than those very "heads" to find themselves linked up as official units in a chain to "rope" in the general public's support for a scheme which appears to us more calculated to disorganise matters already well organised. That such disorganisation may be of value to the purpose for which the "Institute" has been founded we can well conceive—but that is the reverse of the medal, of which we are not permitted a sight. It would be interesting, therefore, to have a really authentic story of those "personal interviews," which have been deemed sufficient justification for incorporating so strong a statement in a communication to the Press asking for the generous support of their editorial columns in giving publicity to the objects of this ill-conceived scheme.

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"I will sum up by saying that the Flying Officers, one and all, have earned my highest commendation."

It was also announced that the following had been awarded the D.S.O.:—

Squadron-Commander R. Gordon, Flight-Commander J. T. Cull, and Flight Sub-Lieutenant H. J. Arnold.

The Distinguished Service Medal has also been awarded to Air-Mechanic Boggis.

## The Roll of Honour.

THE Secretary of the Admiralty has announced the following casualty:—

Under date December 1st:

**Drowned.**

Flight Sub-Lieutenant Basil F. M. Hughes, R.N.

The following casualties in the Expeditionary Force have been officially reported:—

Under date December 1st:

**Missing.**

Lieutenant S. E. Buckley, Northampton Regt., 5th Batt., attached R.F.C.

Second Lieutenant H. S. Ward, Royal Flying Corps.

Under date December 2nd:

**Missing.**

Lieutenant D. W. Grinnell-Milne, R. Fus., attached R.F.C.

Lieutenant C. C. Strong, London R. (T.F.), 13th Batt. (Princess Louise's, Kensington), attached R.F.C.

**Previously Officially reported Missing, now Unofficially reported Killed.**

Second Lieutenant B. G. James, R.F.A., attached R.F.C.

The following casualties in the Indian Forces are reported from the Persian Gulf:—

**Officially reported Missing and Unofficially reported Prisoners of War.**

Second Lieutenant E. J. Fulton, 1st Lancers, attached R.F.C.

Major H. L. Reilly, 82nd Punjabis, attached R.F.C.

FLIGHT

# AIRCRAFT WORK AT THE FRONT.

## OFFICIAL INFORMATION.

### British.

*General Headquarters, Dec. 2nd.*

"ON the 30th two hostile aeroplanes were brought down by fire from our aeroplanes, one falling east of Hooge and the other near Henin Liétard.

"On the same day twenty of our aeroplanes bombed an important German supply depôt at Miraumont, causing considerable damage to stores, buildings, and to the railway.

"One of our aeroplanes which had been on reconnaissance on December 1st failed to return, and another on December 2nd."

*General Headquarters, Dec. 6th.*

"On Thursday last an air raid was carried out against Don Station (east of La Bassée) and the buildings in its vicinity.

"A munition store is believed to have been blown up, and the railway was hit near the station. Some fires were observed in Don after the raid. All machines returned safely, although several hostile machines were met and engaged."

### French.

*Paris, Dec. 1st. Afternoon.*

"In Artois, in the course of yesterday, one of our aeroplanes attacked over the enemy's lines two German machines, one of which was obliged to descend. The other fled, and was pursued as far as Douai.

"During the day of November 28th a French aeroplane dropped six 90 mm. (3½ in.) bombs on the huts near the station of Lens, which were seriously damaged."

*Paris, Dec. 6th. Evening.*

*Dardanelles.*—"Our aeroplanes dropped a large number of bombs on the Turkish encampments."

### Italian.

*Rome, Dec. 1st.*

"Enemy aircraft dropped a few bombs on the villages of Paularo and Misincinis, in Carnia. No damage was done."

### German.

*Berlin, Dec. 1st.*

"An English and one French aeroplane were shot down. The occupants were taken prisoners."

*Berlin, Dec. 2nd.*

"To the north-west of St. Quentin a biplane, containing two English officers, which was forced to descend on account of motor trouble, fell into our hands."

*Berlin, Dec. 6th.*

"In an air-battle in the region of Bapaume, two English aeroplanes were shot down, and the occupants killed.

"Near Markgrafen, on the Courland coast, a German aeroplane was hit from the sea by the Russian artillery. We brought the aeroplane and crew into a place of safety."

### Turkish.

*Constantinople, Dec. 5th.*

"Two German airmen dropped bombs on an enemy monitor, which ceased firing.

"Near Sedd-el-Bahr Flight-Lieutenant Aliriza shot down an enemy aeroplane and bombarded an armoured cruiser, which was forced to steam away. A torpedo-boat which rushed to the assistance of the armoured cruiser ran ashore. Thereupon the aviator opened machine-gun fire against the crew on deck of both vessels, and forced an approaching enemy aeroplane to withdraw.

"On December 2nd the same aviator attacked an enemy monitor which was bombarding our positions. The monitor was obliged to cease fire."

# THE BRITISH AIR SERVICES.

### Royal Naval Air Service.

THE following appeared among the Admiralty announcements of the 1st inst. :—

J. M. Fraser entered as Temporary Lieutenant (R.N.V.R.), with seniority of Nov. 30th, and appointed to "President II," additional, for R.N.A.S.

The following appeared among the Admiralty announcements of the 3rd inst. :—

Lieut.-Commander T. K. Elmsley (R.N.) graded as Flight-Commander. Dec. 1st.

W. T. Curtis entered as Warrant Officer, 2nd Grade, for temporary service, with seniority of Dec. 2nd, and appointed to "President," additional, for duty with R.N.A.S.

The following appeared among the Admiralty announcements of the 4th inst. :—

Capt. D. T. Norris to "President," additional, for R.N.A.S. Dec. 3rd.

Lieut. P. T. Rawlings (R.E. Special Reserve) granted a temporary commission as Lieutenant (R.N.V.R.), with seniority of Dec. 2nd, and appointed to "President," additional, for (E) duties in the R.N.A.S.

The following appeared among the Admiralty announcements of the 7th inst. :—

The following entries have been made :—A. J. H. McColl, as Probationary Flight Sub-Lieutenant, for temporary service, with seniority of October 17th ; G. D'Arcy Meynell and V. Greenwood, both as temporary Lieutenants (R N.V.R.) ; and B. C. Morley, as temporary Sub-Lieutenant (R.N.V.R.) ; all with seniority of December 6th.

### Royal Flying Corps (Military Wing).

THE following appeared in a supplement to the *London Gazette* issued on the 1st inst. :—

*Flying Officers.*—Nov. 10th, 1915 : Temporary Lieut. L. R. Heywood, R.E., and to be transferred to the General List ; Second Lieut. F. N. Hudson, Buffs (East Kent Regt.), and to be seconded. Nov. 11th, 1915 : Lieut. W. E. F. Davidson, East Yorkshire Regt., Special Reserve, and to be seconded ; Lieut. M. S. Stewart, A.S.C., and to be seconded ; Temporary Second Lieut. E. C. Jowett, Northumberland Fusiliers, and to be transferred to the General List ; Second Lieut. W. D. M. Bell, Special Reserve. Nov. 13th, 1915 : Temporary Second Lieut. C. M. Gibson, East Surrey Regt., and to be transferred to the General List ; Temporary Second Lieut. R. H. Peck, Dorsetshire Regt., and to be transferred to the General List ; Second Lieut. J. A. Soames, Royal Welsh Fusiliers, and to be seconded ; Second Lieut. E. Selby, Special Reserve. Nov. 15th, 1915 : Capt. A. M. Wilson, Gordon Highlanders (T.F.) ; Temporary Capt. W. Milne, General List ; Second Lieut. G. R. M. Reid, Princess Louise's (Argyll and Sutherland Highlanders), Special Reserve, and to be seconded ; Second Lieut. M. T. Baines, Royal Wiltshire (Prince of Wales's Own Royal Regt.) Yeomanry (T.F.) ; Temporary Second Lieut. C. Seedhouse, General List.

*Supplementary to Regular Corps.*—To be Second Lieutenants (on probation) : William T. W. Wartnaby ; Oct. 27th, 1915. Eustace S. Perrin ; Nov. 19th, 1915.

The following appeared in the *London Gazette* of the 3rd inst. :—

*Flying Officers to be Flight-Commanders, and to be Temporary Captains whilst so employed.*—Temporary Lieut. J. G. Swart, R.A., and Lieut. A. C. Clarke, Duke of Cornwall's L.I., Special Reserve ; Nov. 17th, 1915. Temporary Lieut. R. T. Leather, Warwickshire Yeomanry (T.F.), and Lieut. M. E. Lane, Special Reserve ; Nov. 20th, 1915. Second Lieut. Hon. O. M. Guest, Lothians, and Border Horse Yeomanry (T.F.) ; Nov. 21st, 1915. Lieut. G. H. Eastwood, Special Reserve ; Nov. 22nd, 1915.

*Flying Officers.*—Nov. 16th, 1915 : Capt. T. A. E. Cairnes, 7th (Princess Royal's) Dragoon Guards, and to be seconded ; Capt. R. E. Orton, East Lancashire Regt., and to be seconded ;

Temporary Second Lieut. P. G. Scott, Gloucestershire Regt., and to be transferred to the General List; Second Lieut. C. Faber, Special Reserve. Nov. 17th, 1915: Temporary Capt. W. A. B. Anthony, Northumberland Fus., and to be transferred to the General List; Lieut. J. V. Steel, R.A., and to be seconded; Second Lieut. E. N. Clifton, Coldstream Guards, Special Reserve. Nov. 20th, 1915: Lieut. R. G. H. Murray, 9th Gurkha Rifles, Indian Army; Temporary Second Lieut. A. J. M. Clarke, Gloucestershire Regt., and to be transferred to the General List; Second Lieut. J. B. Fitzsimons, Special Reserve.

*Supplementary to Regular Corps.*—Sydney A. Currin from Lieutenant (R.N.V.R.) to be Lieutenant. Nov. 2nd, 1915.

The surname of Second Lieutenant (on probation) Frederick J. H. Thayre is as now described, and not as stated in the *Gazette* of Aug. 16th, 1915.

*Territorial Force, R.F.C.*—Second Lieut. (Temporary Capt.) Alfred R. Martin, from East Kent Regt. (Provisional Batt.), to be Captain (temporary) and Adjutant. Nov. 12th, 1915.

The following appeared in a supplement to the *London Gazette* issued on the 4th inst. :—

*Memoranda.*—Lieut. A. R. Earle, South African Aviation Corps, to be Temporary Lieutenant, General List, whilst employed with the Royal Flying Corps, Military Wing. Oct. 25th, 1915.

*Supplementary to Regular Corps.*—Second Lieutenants (on probation) confirmed in their rank: Gerald D. Etches, Sidney Ransom, Maurice Hodge, Norman Turner, and Ernest Bush.

The following appeared in a supplement to the *London Gazette* issued on the 6th inst. :—

*Supplementary to Regular Corps.*—Thomas G. G. Bolitho to be Second Lieutenant (on probation). Nov. 1st, 1915.

The following appeared in the *London Gazette* of the 7th inst. :—

*Non-Commissioned Officer to be Second Lieutenant for Service in the Field.—Royal Sussex Regiment.*—Corpl. Eimer P. Roberts, from Royal Flying Corps, and to be seconded for service with Royal Flying Corps. Oct. 23rd, 1915.

*Memoranda.—Non-Commissioned Officer to be temporary Second Lieutenant.*—Lance-Corpl. Mark Head, from Essex Yeomanry, and to be seconded for service with the Royal Flying Corps. Nov. 10th, 1915.

*Wing-Adjutant.*—Capt. Philip Sidney, Northumberland Fusiliers, and to be seconded. Nov. 25th, 1915.

*Supplementary to Regular Corps.*—Second Lieut. (on probation) Richard P. J. M'Coy is confirmed in his rank.

# MILITARY AVIATION IN JAPAN.

QUITE up to date in its information is the Japanese *Aeronautic World*, a monthly magazine published in Tokyo. The issue for November has a new feature in the shape of two pages of news printed in the English language. By way of illustrating what is being done in Japan, in connection with military aviation, we reproduce below, with its quaint phraseology, the information regarding a cross-country flight which was recently carried out :—

"The military aviators' cross-country flight from Tokorozawa to Aomori and Hirosaki in Aomori prefecture was accomplished on the 9th of November. The army's flight being delayed two days owing to unfavorable weather. The day dawned bright and calm at Tokorozawa Military Aerodrome with light breezes, only one metre per second, while dispatches from Utsunomiya and Otawara, the place being designated as the first landing point midway, reported favorable weather condition.

"Lieutenant-Colonel Arikawa, the leader of the Military Aviation Corps, gave the word to start, and the two warplanes, Lieutenant Iba piloting Maurrice Farman type No. 28, Lieutenant Kawakami piloting the same type No. 26, started from the Aerodrome at 6.50 a.m., making thier positions at the intervals of one thousand metres. At 8.32 a.m. Lieutenant Nagasawa and Liutenant Takeda, piloting Nos. 27, 25 Maurrice Farman biplanes respectively started for Aomori.

"The weather condition was ideal for flying, with windless and cloudless, as being able to look the Nikko Mountain. After a skilfull flight over mountains and rivers, Lieutenant Iba and Lieutenant Kawakami safely arrived and landed at Otawara in Tochigi prefecture at 8.30 a.m. respectively. The two flight officers were received by Lieutenant General Inoue, Captain Tokugawa of the aviation corps and other officers dispatched from the headquarters of the 14th Division at Utsunomiya city.

"Talking of his experience in the air, Lieutenant Iba says that the aerial navigation from Tokorozawa to Otawara was little hard. When his machine flying near Kitsuregawa town, an bad air current appeared and the plane felt a slight oscillation, but he flew faster than Lieutenant Kawakami on the machine No. 26, and reached here now. No. 27 warplane piloting by Lieutenant Nagasawa safely arrived at Otawara in Tochigi prefecture. The well known flight officer was received by a large crowd with enthusiastical cheers, who were in evidence at the ground to look the wonderful man-birds.

"Lieutenant Takeda on No. 25 warplane, who started from Tokorozawa Aerodrome with Lieutenant Nagasawa on No. 27 plane, met with a misfortune. When the aviator was passing on the neighbourhood of Kinumura village, north part of Yuki town Tuga district in Tochigi prefecture, something appeared to go wrong with the motor and ultimately stopped. The aviator made up his mind to land there. About ten o'clock, the warplane fell head foremost from the height of one thousand metres, the aviator skilfully volplaned and safely landed on a field. So he was compelled to break the aerial journey midway. On receipt of the news Lieutenant Adachi came from Otawara and Lieutenant Sone, Engineer Nakazato and other mechanics were dispatched from Tokorozawa in an automobile with construction materials to do repairs. On the following day, the aviator who stopped in the neighbourhood of Yuki town resumed his flight at 6.20 a.m. After half an hour's flight, the airman arrived at Otawara where the three planes were waiting for him. The cross-country flight from Otawara to Morioka had to be postponed owing to the stormy weather in the morning and the heavy downpour of rain in the afternoon.

"Early on 11th morning, the four Military aviators started from Otawara. Passing over Shirakawa, Fukushima city, looking down Nasu volcano, they safely reached the Miyagino Parade Ground, Sendai, between 8.20 and 8.30 a.m. Four warplanes landed the center of the ground skilfully amidst the cheers of the crowd. Four lovely girl students of the Sendai Elementary School presented each of the flight officers a beautiful garland. Mr. Yamada, the mayor and the Sendai citizens gave a welcome meeting in honor of the flight officers at the Military Club. When the banquet was at its height, three lusty cheers were given for the airmen at the instance of the mayor. After two hour's rest with the Sendai people, the airmen again boarded on their machines and after drawing a circle over the enthusiastical crowd, left there at 10.15 and 10.25 a.m The four warplanes successfully reached the Mitakigahara Parade Ground, Morioka city at 12.40 p.m., Lieutenant Kawakami on No. 26, the other planes at 12.47 and 12.53 p.m. There the flight officers were also enthusiastically received by the local folks and given a welcome meeting in honor of the flight officers. Lieutenant Nagasawa was presented two wreathes by the Morioka citizens on account of his birth place there. The warplanes were to reach Aomori city, their final destination, in the course of the day but a strong wind was blowing north of Ichinohe and bad weather never cleared up in the afternoon. The four flight officers were obliged to abandon their pre-arranged flying and to spent the gniht at Morioka city.

"At 6.30 on the next morning, Lieutenant Iba on No. 28 machine, Lieutenant Nagasawa on No. 27 machine, Lieutenants Takeda, Kawakami on No. 25 and No. 26 machines started from Morioka respectively. They flew in file as four wild geese in the air, passing over the mountain Hakkodasan, Higashidake and successfully reached the Aomori Parade Ground, in Aomori prefecture at 7.58 and 8.18 a.m. Lieutenant Takeda and Lieutenant Kawakami who spending one hour with the citizens again started on their flying machines for Hirosaki city, the final destination, at 9.30 a.m. After fifty six minutes' flight in which they reached an altitude of 1000 metres, passing over the mountain Monjitake, the two warplanes safely arrived at the Hirosaki Parade Ground. The distance of the aerial journey, from Tokorozawa to Hirosaki was 440 miles."

### British Flying Officers in Germany.

IN his report on his visit to the British prisoners of war at Ingolstadt, last month Mr. Jackson of the U.S. Embassy in Berlin states that he saw Squadron-Commander Edward Briggs, R.N.A.S. There had been some misunderstanding about this officer's rank, but the matter was being cleared up, and he would probably receive the full amount to which his rank entitled him as well as back pay. In Fort IX were Lieutenant Scholefield, Royal Flying Corps, and Captain Wilson, Scottish Rifles, attached to the Royal Flying Corps; while in Fort X, Lieutenant W. M. Crabbie, 1st Lowland Brigade Field Artillery, attached to the Royal Flying Corps, was the only British officer.

### A Fatality at Hendon.

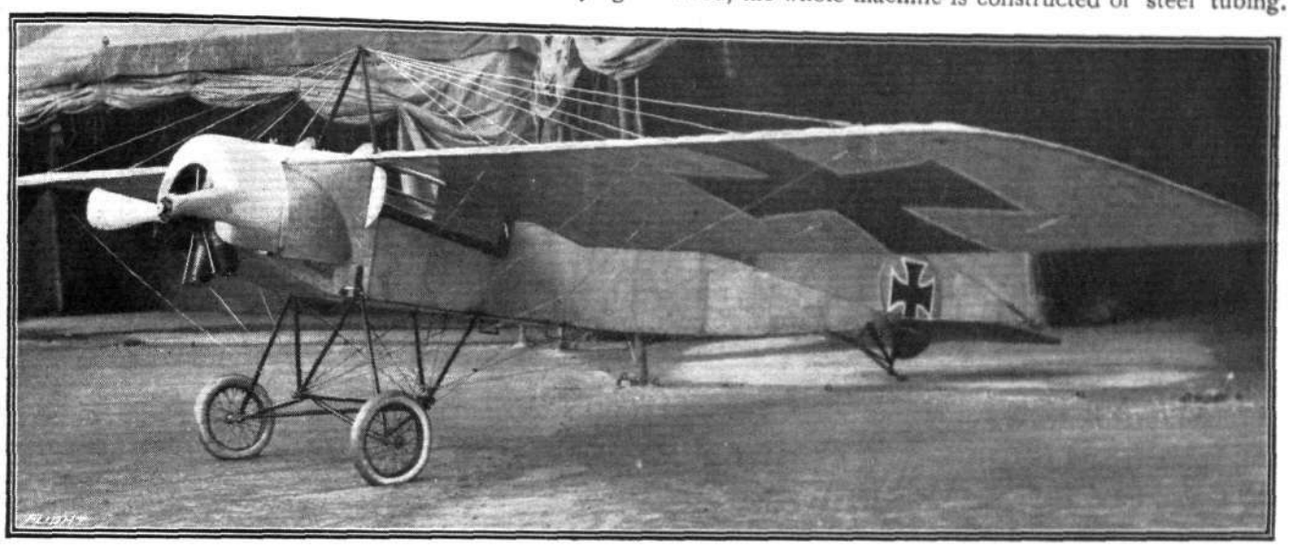
DR. COHEN, the Hendon coroner, held an inquest on the 3rd inst. on William Charles Brandon, aged 22, of the Royal Naval Air Service, who died from the effects of an accident at the London Aerodrome on Thursday.

The jury returned a verdict of death from misadventure.

FLIGHT

# THE CAPTURED GERMAN FOKKER MONOPLANE.

ALTHOUGH not being able to lay any claim to being one of the latest types, such as could the Albatros reconnaissance biplane described recently, the captured Fokker monoplane is interesting, if for no other reason, on account of the example it furnishes of what a German aeroplane constructor can, and does, do when laying himself out to incorporate his own ideas of construction into a design which is a palpable "crib" of a successful French design. Let it be said at the outset that, considered as a whole, the Fokker monoplane does not appear to us to be an improvement on the French Morane-Saulnier or on its British version as produced by the Grahame-White Aviation Co. It is true that several of the constructional details are very neatly thought out, but these, we think, are more than counterbalanced by shortcomings in other directions.



"Flight" Copyright.

Three-quarter front view of the Fokker monoplane.

Aerodynamically the Fokker monoplane differs from the Morane in its proportions and also in the wing section, which is totally dissimilar to that of the French monoplane, having a much flatter "nose" or leading edge and revealing on inspection an entirely different lower camber with its maximum ordinate much farther back from the leading edge.

When turning to the constructional work of the Fokker monoplane radical departures from the French design are noticed. Chief of these is the building up of the body of steel tubes throughout its entire length. In fact with the exception of the wings, which have spars and ribs of wood, the whole machine is constructed of steel tubing. Whether or not this is an advantage is, perhaps, a debatable point, each of the two forms of construction possessing its own merits and disadvantages. By way of example of the last-mentioned, it may be pointed out that a steel tube, while quite strong in its way, may very easily have its strength dangerously impaired by an in itself trivial cause, such as a slight dent made by the dropping of a tool or even by an accidental knock with the toe of a boot.

In the Fokker monoplane longitudinals as well as struts and cross members of the body are, as we have already pointed out, made of steel tubing wrapped with some material that looks like oil cloth, and the function of which probably is to exclude moisture. In shape the body is of rectangular section tapering like that of the Morane to a horizontal knife-edge at the rear. This horizontal stern post takes the form of a short steel tube

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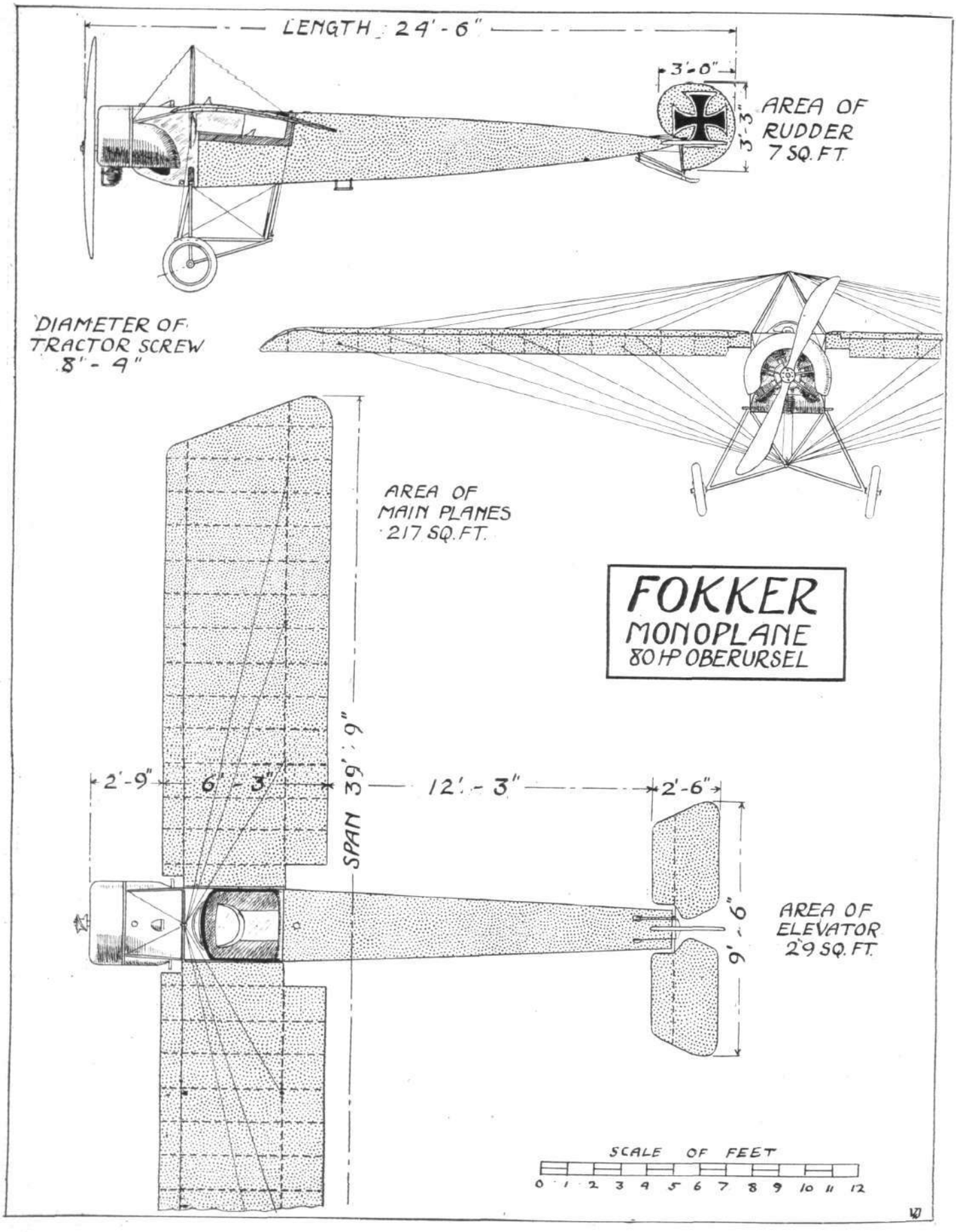
Three-quarter rear view of the captured Fokker monoplane.

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THE FOKKER MONOPLANE.—Plan, front and side elevations to scale.

which serves as a bearing for the main transverse tube of the elevator. This member, which is exactly similar in form to that of the Morane, is also built up of steel tubes, and is partly balanced by the portions of it that are in front of the pivoting line. Of similar construction is the rudder, which, as will be seen from the illustrations, consists, roughly speaking, of two semicircles, of which the smaller is in front of the rudder post, thus serving to bring the centre of pressure and the centre of support closer together than they are in an unbalanced rudder.

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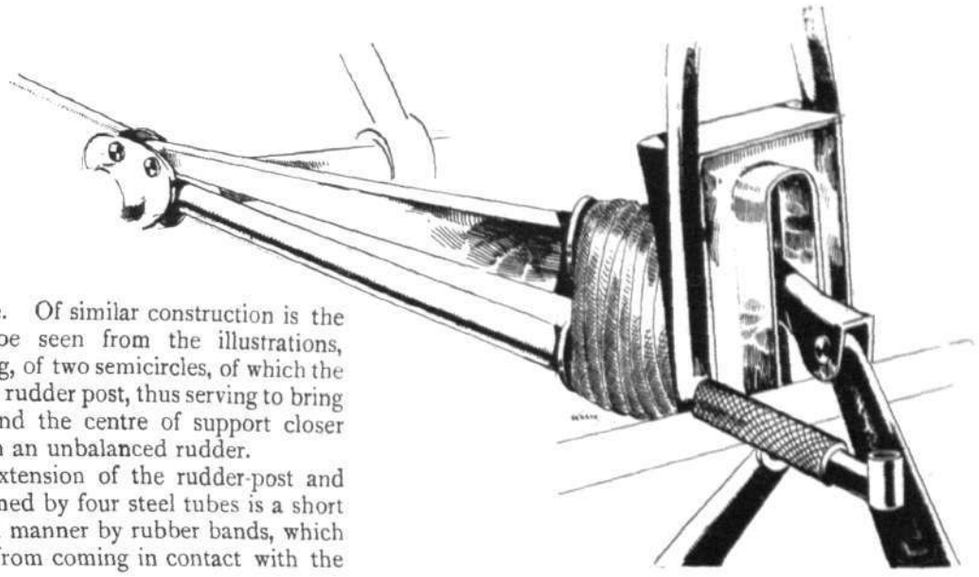
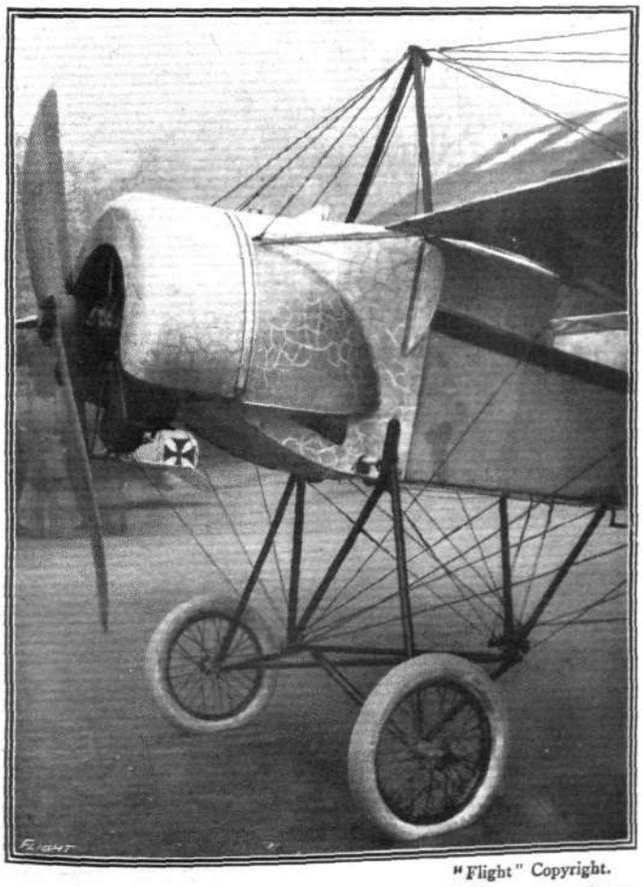
Detail of shock-absorbing arrangement and step bracket on the Fokker monoplane.



Carried partly on an extension of the rudder-post and partly on a pyramid formed by four steel tubes is a short skid, sprung in the usual manner by rubber bands, which prevents the tail planes from coming in contact with the ground.

Pilot and passenger are accommodated in a common cockpit, a seat of the kind generally known as the "bucket" type being provided for the pilot, while the passenger apparently has to be satisfied with just a plain board placed immediately behind the pilot's seat. The controls are of the usual type, a central column for the warp and elevator, and a pivoted footbar for the rudder. At the top the lever is terminated by a double handle grip as shown in one of our sketches. On the central portion of this handle is mounted the cut-out switch for the engine in a position where it is within easy reach of either hand.



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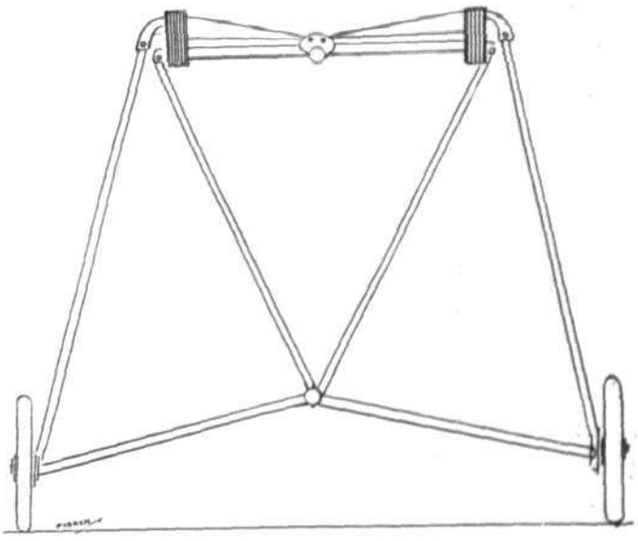
Under-carriage and engine housing of the Fokker monoplane.

Owing to the position of the occupants between the main spars of the wings the view in a downward direction is somewhat restricted. In order to improve it the leading and trailing edges have been cut away near the body as shown in the plan view of the machine, and, probably for purposes of facility in firing downwards, windows have been provided in the upper half of the sides of the body. As the aim of the gunner would be made somewhat more difficult by the rush of air that would find its way inwards and upwards through this opening, a small wind-screen has been placed at the forward end of it as shown in the illustrations.



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Diagrammatic sketch of chassis.

In front the body has been enclosed by aluminium sheeting, a cowl of the same material surrounding the upper half of the engine. This cowl, like so many other parts of the design, is very similar to that of the Morane,

being provided at its rearward end with two curved shields, which collect the oil thrown out by the engine and prevent it from being blown back along the sides of the body.

The engine, an 80 h.p. version of the Gnome, known in Germany as the *Oberursel*, is mounted on overhung bearings *à la* Morane, and drives an Integral propeller of 8 ft. 4 ins. diameter. The *Oberursel* does not, as far as one is able to judge from outward appearances, seem to be nearly as well made as the original Gnome, although in fairness to its makers one should perhaps give them the benefit of the doubt and admit that this may be due to hard usage and long service. Otherwise it does not differ, again as far as can be seen from an external inspection, from the Gnome motor of the same type and h.p. The tanks are placed as in the Morane, *i.e.*, the petrol service tank and the oil tank being mounted in the front portion of the body, while the reserve petrol tank is placed just behind the cockpit. Placed above the top covering of the body in front of the wind shield is a petrol gauge, or, as the Germans call it, Benzin Uhl (petrol clock), not inaptly since it is provided with hands like a clock and calibrated to indicate the number of litres of petrol in the tank.

One of the greatest departures from Morane practice is, perhaps, to be found in the design of the under-carriage. Whether Mr. Fokker's chassis design is an improvement on that of the French machine is, to our way of thinking, a very great question. If properly carried out the German form of under-carriage might be equal to the well-known Morane, but, as exemplified in the specimen captured, it certainly leaves room for great improvements in the detail construction. The general arrangement will be readily followed by reference to our illustrations. A longitudinal member, formed of a steel tube, is carried on two pairs of "Vee" steel tubes secured to the lower longitudinals of the body. Hinged to this tube near the point of attachment to the front "Vee" are the two stub axles, which slope downwards towards the wheels. Two other tubes slope upwards to the sides of the body, where they are linked to short transverse horizontal levers pivoted centrally in the floor of the body. Shock absorbers wound round these levers and a transverse strut in the body provide the springing. A diagrammatic sketch of the arrangement will, supplemented by sketches of the details, explain the action. From the axles radius rods in the form of steel tubes run to the apex of the rear "Vee," the hinge forming the fulcrum for the radius rods as well as those for the stub axles being of a decidedly flimsy character. Again, the attachment of the lift cables to the forward end of the longitudinal member of the chassis looks somewhat amateurish, the cables simply being spliced with an eye sufficiently large to slip over the end of the tube, where it is secured by a washer, which again is held in position by a split pin. Although looking rather unfinished, this form of attachment probably is quite adequate, but it cannot compare in neatness with the Morane method of securing the lift cables.

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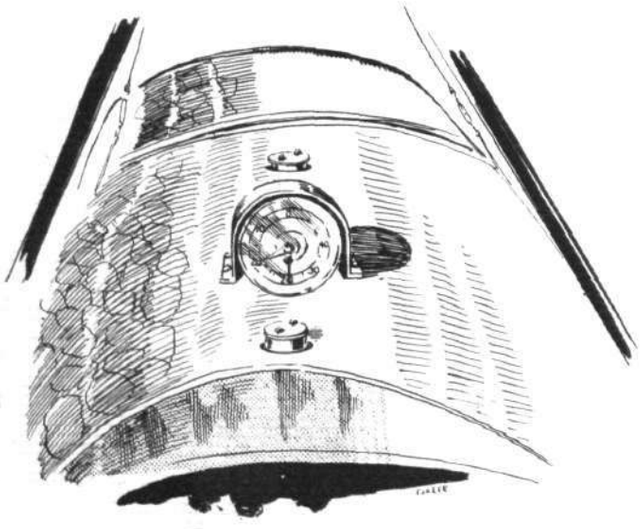
**The control lever of the Fokker monoplane.**

One very neat fitting we noticed in the bracing system of the wings, *i.e.*, the quick release by means of which the bracing cables are attached to the wing spars. It consists, as will be seen from the accompanying sketch, of a hemispherical hollow socket having cut in its side a T-shaped slot and secured, how we were unable to ascertain, to the sheet steel clip gripping one half of the spar. In the top of the T the flat head of the turnbuckle has just room to pass, all that is necessary to detach the cable from the spar being to slacken the cable by giving the turnbuckle a few twists and the head may be pulled out of the cross slot of the T. In a similar way the cable is quickly attached by reversing the process.

In plan form the wings of the Fokker are similar to those of the Morane, having their ends considerably raked so as to increase the effectiveness of the warp.



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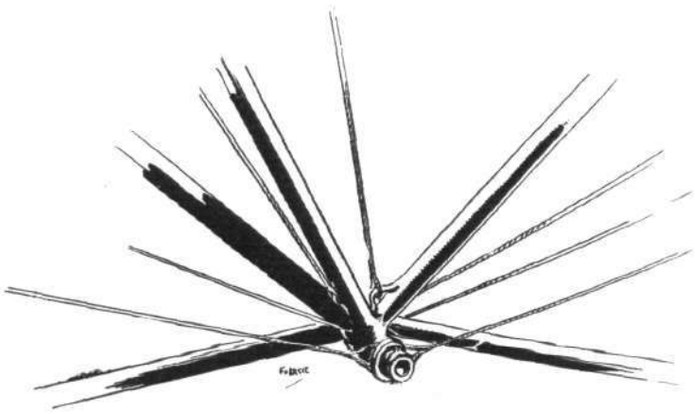
**The petrol "clock" on the Fokker monoplane.**



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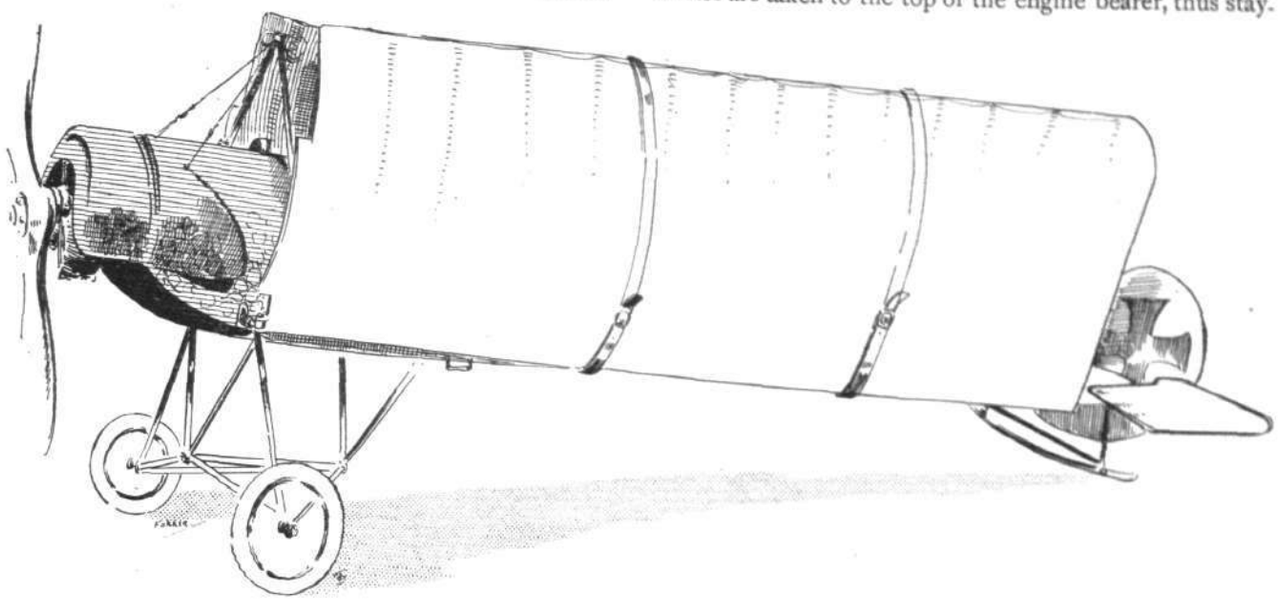
**Attachment of lift cables to chassis on the Fokker monoplane.**

The main spars, which are of I section wood, are fitted at the root with a socket terminating in an eye through which a short bolt passes, thereby securing the spar to the corresponding lug on the side of the body of the

machine. On each side of the body and a short distance in front of the chassis struts is a bracket as in the Morane. From the apex of this *cabane* two cables are taken to the top of the engine bearer, thus stay.

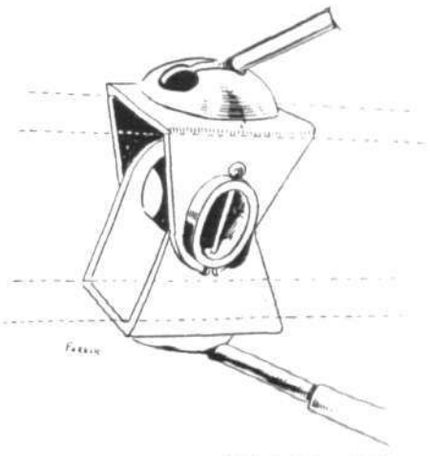


"Flight" Copyright.

The Fokker monoplane with wings folded for transport.

having at its outer end an eye of the same size as that of the spar lug. When it is desired to transport the Fokker by road the wings are detached in the manner described above, and the front spar is placed with its root on this bracket, the same bolt that is used for securing the spar in the flying position being employed to secure it to the bracket for transport. A steel hook bolted to the front spar near its outer end fits into a socket a few inches in front of the tail skid attachment, and when a couple of straps have been taken around the wings the machine is ready for transport.

The top wing cables are attached to a two-legged *cabane* of steel tubes



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Attachment of lift cables to main spars on the Fokker monoplane.

ing it in a forward direction. Being placed in line with the front wing spars the top warp cables, which pass over pulleys, naturally slope backwards to the rear spar, thereby providing the rearward staying of the *cabane*. The lower warp cables run from the wings to short crank levers on the apex of the rear "Vee" of the undercarriage, these levers being operated through vertical cables by a transverse crank lever on the longitudinal rocking shaft inside the body. The warp cables, it will be noticed, are not in line with the front cables, the reason being that the rear spar is longer than the front, and requires different spacing of cable attachments to preserve the load distribution.

"Flight" Copyright.

Side view of the captured Fokker monoplane.

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

### Aviators' Certificates.

THE following Aviators' Certificates have been granted :—

2110 Flight Sub-Lieut. Alan Harper Curtis, R.N.A.S. (Grahame-White Biplane, Royal Naval Air Station, Eastbourne). Nov. 7th, 1915.

2111 Second Lieut. Denis Osmond Mulholland (4th The Connaught Rangers) (Maurice Farman Biplane, Military School, Farnborough). Nov. 24th, 1915.

2112 Flight Sub-Lieut. George Horsley Porter, R.N.A.S. (Grahame-White Biplane, Royal Naval Air Station, Eastbourne). Nov. 25th, 1915.

2113 Flight Sub-Lieut. William Henry Shields Aplin, R.N.A.S. (Grahame-White Biplane, Grahame-White School, Hendon). Nov. 25th, 1915.

2114 Commander Harold Douglas Briggs, R.N. (Maurice Farman Biplane, Central Flying School, Upavon). Nov. 26th, 1915.

2115 John Leslie Horridge (Grahame-White Biplane, Grahame-White School, Hendon). Nov. 27th, 1915.

2116 Second Lieut. Gwilym Hugh Lewis (2/4th Northamptonshire Regt.) (L. and P. Biplane, London and Provincial School, Hendon). Nov. 27th, 1915.

2117 Rupert Neville Braim (L. and P. Biplane, London and Provincial School, Hendon). Nov. 27th, 1915.

2118 Lieut. Norman Alexander Browning Paterson, R.F.A. (Beatty-Wright Biplane, Beatty School, Hendon). Nov. 27th, 1915.

2119 Flight Sub-Lieut. Alexander James Long, R.N.A.S. (Maurice Farman Biplane, Royal Naval Air Station, Eastbourne). Nov. 17th, 1915.

2120 Second Lieut. Cecil Atherton Mercer (7th Royal West Surrey Regt.) (Maurice Farman Biplane, Military School, Shoreham). Nov. 22nd, 1915.

2121 Flight Sub-Lieut. Erith Walter Carlton Williams, R.N.A.S. (Maurice Farman Biplane, Royal Naval Air Station, Eastbourne). Nov. 24th, 1915.

2122 Alfred Gordon Bond (Beatty-Wright Biplane, Beatty School, Hendon). Nov. 27th, 1915.

2123 William Bernard Sherwood (Caudron Biplane, Ruffy-Baumann School, Hendon). Nov. 27th, 1915.

2124 Second Lieut. Edward Wilmer Leggatt (Wiltshire Regt.) (Maurice Farman Biplane, Military School, Shoreham). Dec. 2nd, 1915.

2125 Lieut. Philip George Marr (Maurice Farman Biplane, Military School, Ruislip). Dec. 2nd, 1915.

2126 Charles Lionel Hawtrey Hicks (Maurice Farman Biplane, Military School, Brooklands). Dec. 2nd, 1915.

2127 Commander Michael Henley Wilding, R.N. (Maurice Farman Biplane, Royal Naval Air Station, Chingford). Dec. 5th, 1915.

AMERICAN CERTIFICATES.

356 Murray Bayne Galbraith (Wright Biplane, Wright School, Dayton, Ohio). Nov. 3rd, 1915.

357 Arthur Gerald Woodward (Wright Biplane, Wright School, Dayton, Ohio). Nov. 5th, 1915.

358 Walter James Sussan (Wright Biplane, Wright School, Dayton, Ohio). Nov. 9th, 1915.

359 John Clark Simpson (Wright Biplane, Wright School, Dayton, Ohio). Nov. 9th, 1915.

### Aeronaut's Certificate.

The following Aeronaut's certificate has been granted :—

55 Flight Sub-Lieut. Basil Edward Pease Gregg, R.N.A.S. Dec. 2nd, 1915.

### Extension of the Hours of Opening the Club.

**The Club is now open from 9 a.m. to 10.30 p.m. each day, including Sunday.**

### New Members.

Members are reminded that, according to the Rules, the Annual Subscription of any New Member they may propose, who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1916.

## THE FLYING SERVICES FUND
administered by
## THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

| Subscriptions. | £ | s. | d. |
|---|---|---|---|
| Total subscriptions received to Dec. 1st, 1915 ... | 10,067 | 16 | 4 |
| Employés of A. V. Roe and Co., Ltd., for four weeks ending November 26th, 1915 ... | 26 | 5 | 2 |
| Collected at the Westland Aircraft Works, Yeovil (Eleventh contribution) ... ... | 0 | 7 | 1 |
| Employés of Ruston, Proctor, and Co., Ltd. (Fourth contribution) ... ... ... | 3 | 0 | 0 |
| Total, December 8th, 1915 ... ... | 10,097 | 8 | 7 |

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

## FROM THE BRITISH FLYING GROUNDS

**London Aerodrome, Collindale Avenue, Hendon.**

**Grahame-White School (R.N.A.S.).**—Straights with instructors last week: Probationary Flight Sub-Lieuts. Aitkin, Cuckney, Armitage, and Rampling. Circuits with instructors: Probationary Flight Sub-Lieuts. Aird, Horniman, and Ovens. Eights and circuits alone: Probationary Flight Sub-Lieuts. Malet, Moody and Saint.

**Grahame-White Civilian School.**—Straights with instructors: Messrs. Halet, Leigh, Matthews, Smith, Verguilt, Henshaw, and Forrest. Circuits with instructors:

Messrs. Howe and Phillippi. Eights with instructor: Mr. Yates. Eights alone: Messrs. Gammon and Hughes.

Instructors for week: Messrs. Manton, Pashley, Russell and Winter.

*Brevet* during week: Mr. Horridge.

**Beatty School.**—The following pupils were out during last week: Messrs. Baker, Barnes, Barrow, Begg, Bowick, Branford, Byrne, Collett, Collier, Cumming, Davison, de Harden Jones, Drysdale, Edwards, Fellowes, Gayner, Godfrey, Hodgson, Kirkwood, Martin. Onley, Overton, Patterson, Podmore, Richard, Samter, Schollaert, Thompson, Whincup, Williams, and Willmett.

The instructors were Messrs. G. W. Beatty, W. Roche-Kelly, R. W. Kenworthy, G. Virgilio, A. E. Mitchell and L. L. King, the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron tractor biplanes.

Exhibition flights were given on Sunday.

**Hall School.**—In spite of the abominable weather experienced lately good practice was put in last week by those pupils who took advantage of the calm intervals, in fact, some put in over one hour's practice each on one morning alone. The following were out receiving instructions: With H. F. Stevens: Wilkins, Rattray, and Manley. Doing circuits or figure eights and landing practice alone, Wilkins and Rattray, about ready to quality for certificates. With C. M. Hill: Capt. Grey, Butterworth, Redford, Stirling, Evans, Cook, Nicolle, Dresser, Mann, Shum, Sepulchre, and Manley. With J. Drew: Camberbirch, Arnsby, Wooley, Ormerod, Millburn, Cosgrave, Chapman, Neal, Baron Ackroyd, Le Coq Moir, Roberts, Ridley, Lieut. Cooke, and Collins.

Machines in use: Hall and Caudron tractor biplanes.

The British Caudron Co. have just supplied the Hall School with one of their latest Government-type two-seater tractors, which should prove a useful asset to the school.

The school announces that they have secured the services of Anstey Chave (who has had considerable flying experience in the R.N.A.S.) as an additional instructor.

**London and Provincial Aviation Co.**—Pupils doing rolling last week: Messrs. Van Roggen, Roberts, Medaets, Lees, Egelstaff, Hardy, Loomes, Lambert and Jones. Doing straights: Messrs. Atkinson, Hunt, Heyn, Martin, Woods, Thorp and Burton. Doing circuits: Mr. Burgess.

Instructors: Messrs. W. T. Warren, M. G. Smiles, C. M. Jacques, H. Sykes and W. T. Warren, Jun.

**Ruffy-Baumann School.**—The weather has not been extraordinarily good during last week, but the following pupils have been out on the 60 and 50 h.p. Caudron type school machines:—Messrs. Cole, Vernon, De Grauw, Coppens, Wood, Cuthbertson, Bolton, Griffith, Launoit, Sherwood, Thomson, Laidlaw, Yiule, Dobson, Hoskyn, Hamtiaux, Pauli and Cox.

Instructors: Ed. Baumann, Felix Ruffy, Clarence Winchester and Ami Baumann.

Certificates have been taken by Messrs. Bernard Sherwood, Charles de Grauw and Willy Coppens.

**Northern Aircraft Co., Ltd.**

**The Seaplane School, Windermere.**—Flying possible on Thursday only last week.

With instructor: Benson (6 mins.), Coats (10), Ingham (12), Macintyre (7), Salton (6), and Stubbs (14). With instructor as passenger: Inglis (21 mins.), Part (14), and Shaw (9). Figures of eight or circuits: Coats (9 mins.) and Reid (22). Straights: Robertson (6).

Instructors: Messrs. W. Rowland Ding and J. Lankester Parker.

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# CORRESPONDENCE.

## The 10,000 Feet Parachute Drop.

[1915] Many persons who have known that my "Guardian Angel" parachutes have been under test by the Admiralty Air Department for the last ten months, have concluded that one of them was used by Lieut.-Col. Maitland in his remarkable descent of 10,000 ft., and during the last few days some hundreds, including some complete strangers, have addressed me for an explanation as to why this parachute fell for several hundreds of feet without opening.

As Lieut.-Col. Maitland's daring fall has deservedly attracted great attention in the Press, and as the impression that it was one of my parachutes which failed to open seems to be widespread, and is likely, if uncontradicted, to seriously impair the reputation of my invention, I shall be grateful if you will allow me to say that the fall was not made in one of my parachutes.

It was in view of the danger with ordinary parachutes of not opening for many hundreds of feet, and sometimes not at all, and of the many deaths so occasioned, that about five years ago I commenced experimental work to see whether it would be possible to design a life-saving parachute that would open instantaneously and automatically, and so be of service when catastrophe overtakes an airman in the air.

In this I have succeeded very completely, and it may be of interest to you to know that the "Guardian Angel" parachute, which has now arrived at its standardised form after a long and gradual development, has never once failed to open instantaneously and automatically in all the numerous private and official tests that have been made with it. The tests have proved that its slowest phase of opening is from a balloon in still air, when it opens in two seconds, and that its speed of opening is in direct ratio to the speed of the aircraft from which it is dropped. The highest speed of opening, as registered by the biograph, was from an airship travelling at 34 miles per hour, when it opened in one-fourth of one second.

I understand that Lieut.-Col. Maitland had a special object in making a fall from as high a height as 10,500 ft., but I may perhaps be permitted to say in answer to many who have mistakenly congratulated me that a fall from a great height is not the critical test of a parachute, for every well-made parachute—if it should open—will make a long descent equally well. Those familiar with parachute technics will agree that the really critical test is the *lowest* height from which a parachute can be dropped to land its man safely. My "Guardian Angel" parachute will do this every time from an altitude of only 200 ft.

My parachute is fitted with harness, from which a man cannot fall out, although it can release him instantly upon landing. The action is entirely automatic, and all that the airman has to do from an aeroplane, airship, or balloon is to jump overboard in his harness, his weight automatically launching and expanding the parachute.

The "Guardian Angel" parachute does not demand from the aviator using it any of the poignant emotions which it was stated were suffered by Lieut.-Col. Maitland upon this trip. It is the Pullman car way of parachuting. It has been an object with me in designing this parachute to make it so safe, easy and comfortable in use that airmen, who are now so prejudiced against ordinary parachutes on account of their unreliability, may take to it quite kindly as a normal part of their aerial equipment. They can place the most perfect confidence in its always doing what it has been designed to do, because it is a machine of which all the parts can act only in ordered sequence and in predetermined paths. My inventions have brought the parachute, hitherto a most unruly contrivance, under complete static and kinetic control.

E. R. CALTHROP,
M.Inst.C.E., M.I.Mech.E.

Eldon Street House, London, E.C.,
December 3rd.

[The parachute descent to which Mr. Calthrop refers is that which Lieut.-Col. E. M. Maitland, R.N.A.S., is reported to have made recently from a balloon, piloted by Flight Lieut. J. Dunville and Flight Commander Corbett Wilson, which ascended from Hurlingham. It was reported that Lieut.-Col. Maitland jumped over the side of the basket when 10,500 feet up, that the parachute fell 300 feet before opening, and after a swaying descent of fifteen minutes, a safe landing was made in Surrey.—ED.]


"Ah, make the most of what we yet may spend,
Before we too into the dust Descend;
Dust into Dust, and under Dust, to lie,
Sans Wine, sans Song, sans Singer, and—sans End!"

*Omar Khayyam.*

WITH the four corners of the world under arms and flying at one another's throats, the word Peace conveys to the mind but one understanding, that of the cessation of hostilities between the belligerent armies. Could Germany go back to the early months of 1914, before she started the stone rolling which shall crush half the world, and have the knowledge gained by sixteen months of battle for her guidance, this war would not now be raging.

When Germany sues for peace, as we honestly believe and earnestly hope she will be forced to do, it will not be in sorrow at the losses in men and money, nor to prevent further sacrifices, but because of the growing impossibility of keeping up the supply. She will recognise that she is not powerful enough to carry through her policy of world's power against all opposition. But for her to attempt the task would in any case only have been a question of time. When she judged herself strong enough, as she did in the middle of 1914, she would have done exactly as has been done, because there is something in man's nature that ousts most of his better feelings, and at periods makes it absolutely impossible for him to live in perfect peace with his fellow man for any lengthy space of time. World's Power was but an excuse. To Germany, or its rulers, no doubt it seemed imperative, both for her own gain, and for the benefit of the world. To us, and to others, it seemed the worst possible thing that could happen. Therefore when the world is divided in opinion, there must be a doubt.

Could such a thing ever have come to pass, could Germany have conquered the whole world, could she ever have had power equal to her frightfulness and have exterminated every living soul not of German blood, so that the whole world contained but Germans, yet should the same thing have come to pass in the future, and they would have fought amongst themselves as bitterly as they now fight against us, because of that kink in man's nature, noble animal as he supposes himself to be, which makes it impossible for him to love his fellow man as himself, and fight he must, under an excuse, or with no excuse at all.

Let us forget for the moment that this terrible war is raging, and look to ourselves, to our lives in times of peace, and we shall find that we are antagonistic to an almost unbelievable extent.

In spite of the many charitable acts we may do, in spite of, as the case may be, the hosts of kindnesses performed throughout a long and honourable life, uncharitableness commences in the nursery, and ends only in the grave. It is delightful to think of children playing peaceably together with their toys. But do they? Georgie will puncture Gracie's doll high up, out of sight, in order to let the sawdust out and bring tears to the eyes of the owner, and Billie will melt Charlie's lead soldiers on the fire-bars. Interrogated, they will offer as an excuse that they only did it for fun, whilst we are inclined to look upon it as mere devilment, and in seeking something whereby we may excuse them to ourselves, we expound a truth and say "Boys will be boys," which is acknowledging inborn antagonism.

It is a force in nature of which I am not very sure, but which I recognise as being turned into the only excusable direction in the desire to excel in athletics, in learning, in business—although in all these it is not personal gain that is sought, so much as the beating of others. In athletics, the prize to be won often does not total in value the amount expended in gaining it. In learning, we do but strive to excel in order to shine above others. In business we continue long after we have accumulated riches far more than we shall ever need, in a desire to outdo our neighbours in the lavishness of our ostentatious display, and thereby reduce them to that state so enjoyable to us, whereby we "make them feel small."

Let us examine in our own little world of aviation, and see how this force, this antagonism is working. And let us not deceive ourselves that because this undesirable thing is a part of the worse side of every man's nature, it cannot be subjected, or even eliminated, at any rate in its ungenerous form. To this purpose, and for the purpose of the governing of the many other passions necessary in the composition of a man's nature—all however needing to be kept in subjection—man has been given a conscience to direct, and a power to subdue.

And even believing man to be as bad as I suggest, conscience, finding itself unable to prevent an ungenerous act, never allows its perpetrator to go untouched, hoping (if a conscience can hope) by this "twinge" to prevent further happenings of a like nature.

There is no excuse; every ungenerous act is deliberate.

One would have thought that flying, from the very nature of it, would have brought out the best that is in men, but this does not always appear to be the case. In the early days the *Esprit de corps* was very marked, and goodfellowship simply radiated from all concerned. Men practicalised their theories and built machines side by side in one shed, or in adjacent sheds, and each was as keenly interested in his neighbour's machine as in his own, and each would discuss and suggest and help the other to the uttermost.

Workers ran from one shed to another to borrow a spanner, or a length of wire, or any old thing that happened, with the certainty of being obliged with pleasure, were it possible. A machine brought out for trial would empty all the other sheds of workers, who trooped out, not only hoping for the success of their brother worker's efforts, lending a hand to start up, and crowding round to shake his hand, did he but fly a few hundred yards, but offering genuine condolences should failure happen: and failure did happen pretty frequently to those large-hearted men of the old school.

Ah! they were grand old days, and those of us who

participated, tasted of a joy conspicuously moderated in later activities.

Of course, in those days, even the most enthusiastic hardly dared to think that aviation would ever become the gigantic industry which we know to-day, and in this, as in most things, it is the survival of the fittest, both in men and machines. Yet I see no reason why men should be so bitterly antagonistic.

No single machine is so good as to be unapproachable by others, no pilot so clever but that others may be equally skilled.

The personal pleasure following great achievements is born of the knowledge of the respect of others, is greatest in the truly great, and none have respect to such over-extent as to wantonly dissipate it by ungenerous acts without it suffering thereby.

A vast proportion of workers in aviation to-day, appear to be against their fellow workers, nor is any great pains taken to disguise the fact. In one instance only, that of serious injury to a pilot caused by a bad smash, will men forsake their unnatural position and become men as men really should be, and were intended by the Great Creator to be, and one and all will rush to his assistance. Yet it is true, that short of actual injury to the pilot, most of those not directly interested in any particular machine—that is to say if it be not of their school—take an unholy delight in seeing it "go west." Nor is their ungenerousness confined to the machine only, for, though I credit them with not wishing any serious harm to the pilot, not one will offer a helping hand in minor troubles. I dare not make this accusation against some of those in our great industry without pointing to facts. Two will suffice, which those participating in will probably recognise.

When the little Caudron was first introduced into England, Mr. Ewen was flying it. One night, when darkness had set in, he had not returned to the aerodrome, and flares were lighted for his guidance. The whisper was "The Caudron has not returned," and one man made the audible remark—not, I am sure, wishing any harm to Ewen—that he "Hoped it never would return," and got finely walked into by friend Warren in consequence.

In the second instance, a pilot, now with the services, having flown over on a visit to the aerodrome where he was taught, required a little petrol to dope his engine, having found some difficulty in starting up. He procured this after great trouble, and after having been at first refused by a representative of the school where he paid to learn. It is unworthy of man that he should lose, not only the respect of others, but his self-respect by descending to such petty acts of illwill towards others.

We are none of us irreplaceable, and if we were, probably the world would go on just the same without us, and forget that we ever existed. Let us therefore do the best we can for ourselves and for others during the short time at our disposal, and remember that good actions can only bring their reward to us during lifetime—whether our head-stone record us good, bad, or indifferent or have never a word to say upon our brief life on this whirling globe.

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"SOMEONE will cross the Atlantic in an air-boat the first fine day that the world is again free to take interest in that side of the development of flying. This could be done any day now. Craft is already in existence which could cross the Atlantic in a single, non-stop flight." This is a statement made by Mr. Glenn H. Curtiss to a representative of the *New York World*, when asked for his opinion of the effect of the lessons learned in the great war on the future development of the aeroplane. As Mr. Curtiss has built a number of large machines, notably the "America," with which Commander J. C. Porte was to have made the attempt on crossing the Atlantic, he may be taken as representing hard and cold facts and not dreams of the future. Later on Mr. Curtiss mentions that Mr. Wanamaker, for whom the "America" was built, is still as keenly interested as ever in the trans-Atlantic flight. When the trip had to be abandoned last year, Mr. Curtiss bought the "America" back on the understanding that he would build Mr. Wanamaker another machine with which to make the attempt as soon as circumstances would permit.

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That Mr. Curtiss is confident of the feasibility of the project is evident from the fact that in the interview he mentioned that next time the flight will probably start from New York City, the first stage being from there to St. John's, Newfoundland, and the second place of call the Azores. In Mr. Curtiss' opinion it will be more a matter of the man at the wheel. The machine, he says, will easily carry all the supplies necessary even for a non-stop flight from coast to coast. The two stops at Newfoundland and the Azores will be more to meet the needs of the aviator than the necessities of the machine. The matter of training the aviators for the flight is also being discussed. The probabilities are that the machine will be stationed at New York City, whence flights will be made along the coast and out to sea. When a man can do about 750 miles at a stretch the trans-Atlantic flight will, it is thought, present few further difficulties. As regards the time for the attempt, nothing definite can of course be said yet. It will be made at the earliest possible opportunity—perhaps even next year. While wishing Mr. Curtiss and Mr. Wanamaker, as well as the man or men who actually make the attempt, the best of luck, one cannot help hoping that their start may be a little delayed, so as to give some of our constructors and aviators a chance. At present they are naturally much too busy in other directions to find time to produce a machine capable of such a journey.

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Of the many German machines captured by the Allies, several have been L.V.G. biplanes, of which a great number are in use by our enemies. In the accompanying photograph is seen one of the latest models of the L.V.G. type. Behind it will be noticed the high-speed Morane-Saulnier single-seater flown by the French aviator,

Adjudant N—— when he forced the German machine to descend, under the following circumstances : On October 26th the French aviator was flying a single-seater Morane-Saulnier between Dormans and Château-Thierry, and chased an enemy machine which fled towards the German lines, when he sighted another hostile aircraft going south towards the French trenches. He immediately started in pursuit, and when arrived over the Marne, the German turned about and, finding himself tackled by the French *avion*, gave battle. While the enemy observer worked his machine gun, his pilot tried by quick manœuvring to evade his pursuer. He plunged downwards at a steep angle, but was followed by the Morane-Saulnier, the pilot of which discovered his antagonist again below the clouds. Adjudant N—— approached to within 500 metres of the enemy without answering his fire. Then, taking advantage of a lull in the German observer's fire, he flew straight at the L.V.G. and when within about 50 metres of it, got busy with his *mitrailleuse*. Being not only a clever pilot but also a good shot, Adjudant N—— succeeded in placing several bullets in the engine of the L.V.G., which stopped working. The enemy machine landed immediately, and the two occupants, a captain and a cadet, the latter being the pilot, vainly endeavoured to set fire to their machine. Adjudant N—— landed close to the German machine and the two aviators surrendered without offering any resistance. The L.V.G. is one of the latest type, and is fitted with 160 h.p. Mercedes. The passenger occupies the rear seat, from where he operates a machine gun mounted on a turntable similar to that of the large captured fighting type Albatros which was on view at the Horse Guards Parade. Apart from the gun the armament of the L.V.G. consists of a bomb-dropping device holding four bombs.

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In view of the enormous extent of the expansion of our Air Services, it is not surprising to find that the men of both the R.F.C. and the R.N.A.S. should be publishing their own weekly sheet. To the men stationed at Jersey Brow, South Farnborough, belongs the credit of being first with their cheerful little paper called "The Jersey Brow Gazette." It is all the more regrettable that those responsible for its publication should have seen themselves forced to cease publication owing to lack of time in which to produce the "Gazette," as it was distinctly humorous and showed that the R.F.C. men among them had a considerable fund of journalistic talent as well as ability to wield the artist's brush.

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Quite recently the men of the R.N.A.S. at Felixstowe have commenced publication of *their* periodical—a bright little four-page paper—which is given the very appropriate title "The Wing." The Editor of this sheet is Isidore Oliphant, and his Sub-Editor, Norman McArthur.

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There has been "a certain liveliness" at the works of the L. and P. Aviation Co. at Hendon for some weeks past, the reason for which may now be divulged. Two machines have just been finished, which are both passenger-carriers, one a 45 h.p. and the other a 60 h.p. During the test flights recently the 60 h.p. was flown in a 30 m.p.h. wind by Mr. M. G. Smiles, who had no difficulty in reaching the 2,000 feet mark with a passenger.

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Two more machines are in course of construction also for the Bournemouth Aviation Co. One of these—a 35 h.p. biplane—is nearly completed and should be ready in the course of a couple of weeks, while the other—a 40 h.p. machine—will follow shortly.

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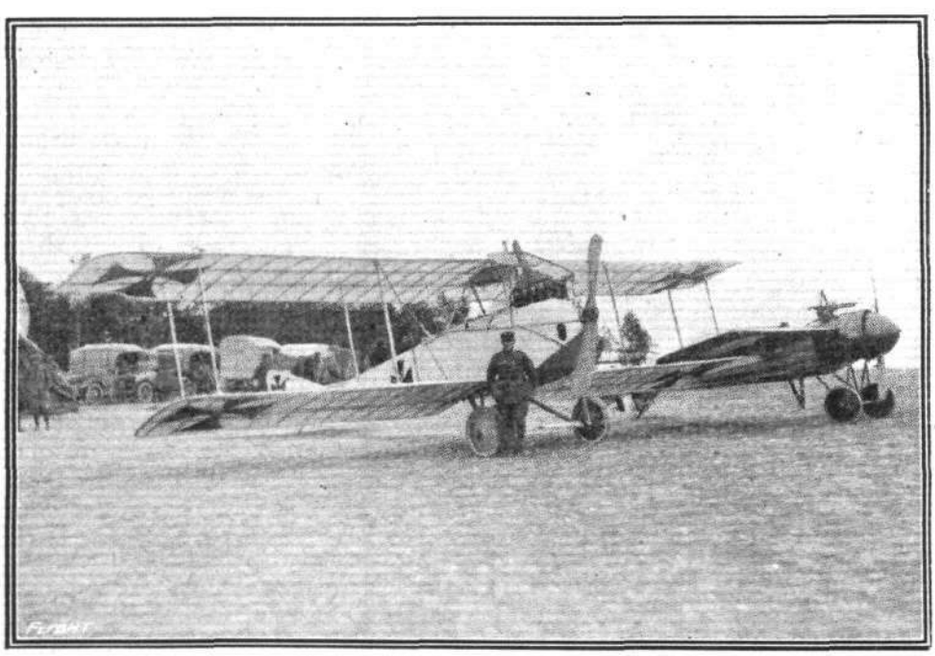
"Dropping in" at the Beatty sheds at Hendon the other day, I found some interesting developments in full swing. The little 50 h.p. Gnome-Beatty-Wright biplane, on which Mr. Roche-Kelly has been doing exhibition flying, is being fitted with a little *nacelle à la* H. Farman. The transmission gear has been removed, the Gnome driving the propeller direct. A saving in weight of about 160 lbs. has thus been effected, and as the *nacelle* will reduce head resistance considerably there should be quite a fair improvement in the speed. Whether or not the placing of the propeller centrally instead of outside the tail-booms will necessitate any alteration of the tail planes, it is difficult to say. If my memory serves me rightly Mr. Alec Ogilvie, when substituting an N.E.C. engine for the Wright engine on his Wright biplane, found that the tail had to be altered because the N.E.C. revolved in a direction opposite to that of the Wright.



**Captor and Captive.—A German L.V.G. biplane forced to descend by the French aviator, Adjudant N——, who was flying the little fast single-seater Morane-Saulnier monoplane seen in the photograph beyond the German machine.**

In addition to these alterations to the little Beatty-Wright pusher the parts for the new Beatty tractor, for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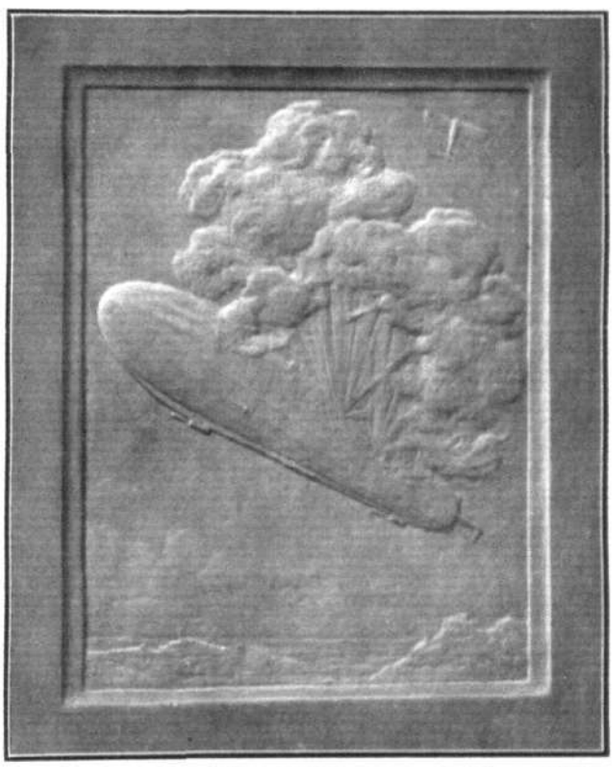
**A model of the memorial to the late Flight Sub-Lieutenant R. A. J. Warneford, R.N., V.C., which has just been completed by Mr. Frank Lynn-Jenkins, R.B.S., the well-known sculptor, and which is to be erected over Lieutenant Warneford's grave in Brompton Cemetery. The funds for this memorial were raised by the *Daily Express*. The wording under the portrait of Lieutenant Warneford is "Courage, Initiative, Intrepidity."**

the design of which I understand Mr. E. Boyle is responsible, are coming along. Judging from the general arrangement drawings and from the detail working drawings, this little machine should make a very good "ticket" 'bus, it being hoped that she will do over 50 m.p.h. although only fitted with a 35 h.p. "Y" type Anzani engine. The *fuselage* is of a fairly good streamline form, and as the chassis is of the simple "Vee" type there should not be a great deal of head resistance. Moreover, at the higher speed possible with such a small, light, *fuselage* tractor biplane the engine will probably be better cooled and therefore stand up to the work quite satisfactorily. It has always been a source of marvel to me that the "Y" type Anzanis run so well as they undoubtedly do on school machines, being continually taxied across the ground for long periods and necessarily getting insufficient cooling. Apart from the interest attaching to the new Beatty biplane aerodynamically, some of the fittings are very ingenious in their simplicity and would seem to be admirably suited for a school machine in which first cost and upkeep should be kept as low as possible.



*Copyright of Mr. Frank Lynn-Jenkins, R.B.A.*

**The panel in the lower part of the memorial to Flight Sub-Lieutenant Warneford, depicting the deed for which he was awarded the Victoria Cross.**

News has just come to hand of a fine flight up Hendon way. J. H. Moore, who really does not seem to be able to keep out of the *nacelle* of that handy little mount of his, set out on Wednesday morning to see how high he could make her climb. After forty minutes of going the altimeter showed 8,500 ft., which, considering that he was not forcing the 'bus at all, is a pretty good performance for a 55 h.p. machine. At this height the velocity of the wind was somewhat in excess of the speed of the machine, for Moore, when he headed for the 'drome into the wind, found himself drifting away from it! However, by diving down to a lower altitude, where the wind was not so aggressive, he managed to regain the 'drome, having been up for a little over an hour, which promises well for Moore's future air-work. "ÆOLUS."

# FUME REMOVAL IN DOPING ROOMS.

ONE result of the accelerated output of aeroplanes both by the established makers and by sub-contractors has been the increased attention which has had to be given to the removal of deleterious fumes from the workshops where doping of the planes is carried on. It is not a question of ventilation in the ordinary sense, as the fumes are of a very heavy nature and therefore keep to the lower part of the building where they are unaffected by the ordinary systems of ventilation. It is therefore essential that arrangements should be made which will ensure the noxious fumes being carried away and fresh air supplied to the operatives, otherwise, as events have proved, fatal results may ensue. We have recently had an opportunity of examining three systems which, with their usual enterprise, have been devised by the Ventilating Engineering Department of the General Electric Co., Ltd., of 67, Queen Victoria Street, E.C., to meet different conditions which will now be referred to.

A diagram of the most efficient system is shown in Fig. A. In this system the fumes are extracted at a uniform velocity from all parts and carried up for discharge above the roof. A centrifugal fan direct coupled to a "Witton" motor is used. On the intake side is a duct running the full length of the shop, having openings with adjustable sliding doors at the floor levels, and on the discharge side is a duct running up the side of the building to a point just above the roof and fitted with a cowl suitably designed to ensure the fumes being shot upwards and efficiently dispersed. If the dope shop is a building by itself the duct can be erected in any convenient position at the side or in the middle of the building. In those cases where the dope shop happens to form part of a large area of workshops the duct can be arranged so as to carry the fumes to a convenient position for fixing the fan and discharge arrangements. By means of the sliding doors it is possible to regulate the area of the openings to obtain uniform extraction at all points, as naturally the opening furthest from the suction would have to be of the largest area. In selecting a suitable fan there are several points to be considered. First, the exact cubic content of the shop must be ascertained. Secondly, the length and size of intake duct which would be most convenient must be decided upon, taking into consideration the fact that the larger the area allowed, the smaller will be the fan required. Thirdly, the length and size of the discharge duct. The voltage available for the motor must also be known. If the supply is an alternating current one, the frequency must also be determined. Where possible the "power circuit" will of course be used. With this information the fan makers will be able to decide the size of fan, which should be capable of changing the air not less than twenty times per hour. It is recommended, however, that a greater number of changes should be allowed, even to the extent of sixty times per hour. It is possible to fit a speed regulator to the motor, so that the output of the fan can be raised according to circumstances. When fixing it should be arranged that the motor is not subjected to the fumes, as, alternatively, it must be fume and flame proof. Suitable protection from the weather should be provided for the fan and motor. It is essential to remember that the supply of fresh air is just as important as the exhausting of the fumes and fresh air. Inlets of liberal area should be provided, preferably in the wall furthest away from the ducts when fitted on one side or on both parallel sides when the duct runs down the centre.

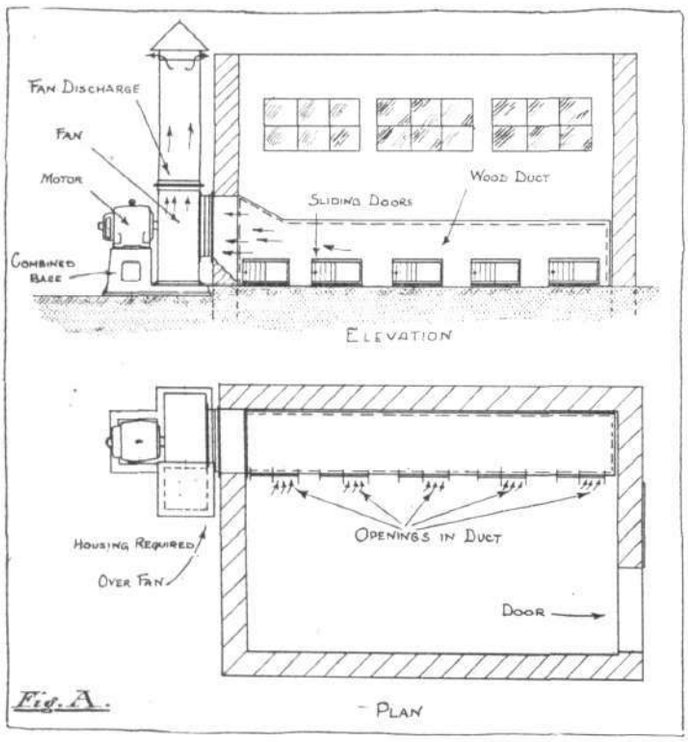


Fig. A.

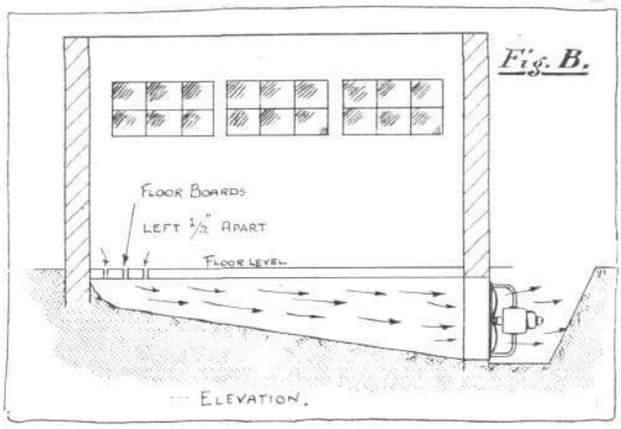


Fig. B.

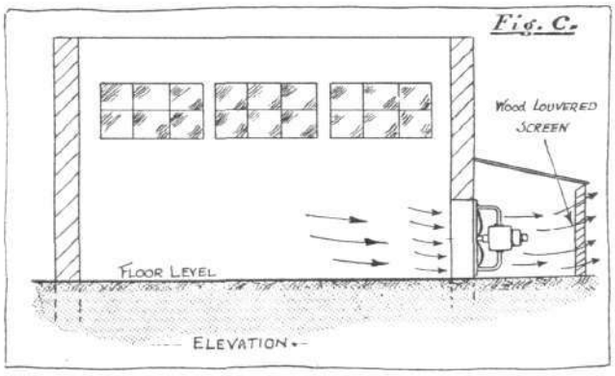


Fig. C.

Fig B is a diagrammatic sketch of a system using a special propeller blade exhaust fan as supplied by the G.E.C., with fume and flame proof motor. To cope with the fumes and obtain a fairly even velocity over the floor,

a tapered cellar is provided with the floor boards left half an inch apart. The fumes are then drawn down through the spaces, and owing to the tapering are drawn at practically equal rates from both ends of the room. It is preferable to have small fans of high speed rather than large fans of low speed, so that the fumes are discharged and dispersed at a higher velocity.

Where it is not possible to arrange the fans in this way they can be fitted as Fig. C on the floor level, and in order to avoid dead corners it is advisable to employ two or more fans according to the width of the room. It is of course equally important in these cases as in that of Fig. A to make ample provision for fresh air. These two systems are of course cheaper in both initial and running cost than the system as Fig. A, but can only be employed when the resistance to the flow of air is low. In arriving at the fixing position for the fans in Figs. B and C due consideration must be given to the direction of prevailing winds; in fact it is advisable to erect on the discharge side louvre ventilators to neutralise the effect of strong winds blowing on the fans and causing back draughts.

# SOME AMERICAN AERO ENGINES.

## THE MANLY (1901).

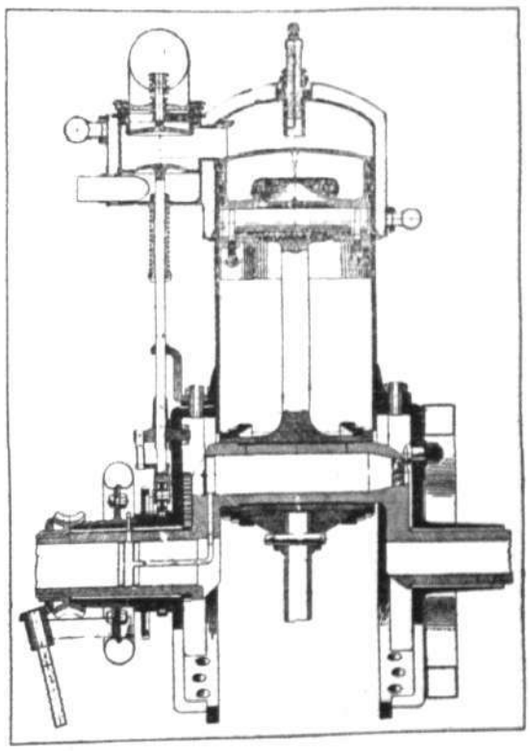
SINCE the Manly 5-cylinder radial engine constituted what was practically the first successful aero engine, being built in 1901, and as several points in its design more or less anticipate modern practice, we will, perhaps, be excused for including it amongst the descriptions of American aero engines appearing in these pages.

This engine was designed by Mr. Charles M. Manly for Professor Samuel P. Langley, for use on his famous tandem monoplane. It will be remembered that the Langley "Aerodrome," in practically its original form, including the Manly engine, was successfully flown for the first time by Glenn Curtiss on May 28th, last year. The engine used in this machine was the outcome of experiments with water-cooled and air-cooled radial stationary and rotary engines. It is a stationary engine with the five water-cooled cylinders, having a bore of 5 ins. and a stroke of $5\frac{1}{2}$ ins., disposed radially round the crankcase. Each cylinder was drawn from a $\frac{3}{16}$ in. steel plate, and then machined inside and out, giving a $\frac{1}{16}$ in. shell. The valve chamber, machined from a solid forging, was brazed to the cylinder shell. The water jackets, perhaps the most interesting part of the engine, were of thin sheet steel, ·02 in. thick, brazed on to the cylinders. These jackets were brazed on by Manly himself, as no one else could be found who would undertake the job, for it must be remembered that little was known at that time of the electrolytically deposited copper jackets.

As a certain amount of difficulty as regards lubrication would have been experienced with the pistons bearing directly on the steel cylinders, cast iron liners $\frac{1}{16}$ in. thick were shrunk in the cylinders, a procedure considered by many at that time to be impractical, but which, as a matter of fact, proved highly successful The connecting rods were attached to the single crank-pin after the fashion now common with most radial and rotary engines, *i.e.*, by means of a master rod to which the other rods were connected. By this means the one large bearing of the master rod was the only wearing surface on the crank-pin, the other rods only "slipping" a very small amount over the master rod big-end, due to the angularity of the rods.

The inlet valves, of large diameter, were automatic, and the exhaust valves were mechanically operated. The mechanism operating these valves was exceedingly light and simple, consisting of central cam having two points 180° apart, and rotating at one-quarter the engine speed. Coil and battery ignition was employed, an equally hot spark being obtained in each cylinder by the use of one spark coil and trembler for all the cylinders. A distributor conveyed the current to each of the plugs at their respective sparking moments. The sparking plugs in use at the period this engine was built were found to be unsuitable, as they soon sooted up and short-circuited, so a special type of plug was designed, which more or less eliminated this trouble. This plug is shown in the accompanying sectional drawing of the engine, and its principal feature consists of the skirt or pocket formed round the electrodes—a feature found on many modern plugs.

Very little oil was wasted, as the lubrication was mostly by oil cups, hence the oil consumption compared favourably with similar engines of to-day. The results obtained from three ten-hour tests were remarkably good, equal to many of the best obtained now. At 950 r.p.m. 52·4 h.p. was developed, and the weight of the engine alone was only 124·17 lbs. The weight of engine complete with ignition coil, batteries, carburettor, water, &c., was 191·6 lbs., giving a weight per h.p. of only 3·65 lbs.



**Sectional view of the Manly 5-cyl. radial engine, practically the first successful aero engine (1901).**

# AIRCRAFT AND THE WAR.

THE *Times* correspondent at Amsterdam, writing under date November 30th, stated :—

"The airmen of the Allies are active in the region of Roulers."

Writing from the British Headquarters under date of December 4th, Mr. G. Valentine Williams, the *Daily Mail* special correspondent, gave the following details of some recent air work of the British pilots at the front :—

"Retaliation is what the Germans are getting now. It is retaliation with a vengeance. Above, on, and below the ground we are at them incessantly, notwithstanding the most unfavourable weather conditions imaginable—a thick Scotch mist alternating with drenching showers of rain driven by a warm south wind.

"In addition to almost incessant artillery fire right along our front, we are continually exploding mines at different points, while our aircraft are making highly successful raids far into the enemy's country. The latest terror added to the life of the Germans at the front are such nocturnal invasions of their trenches as that which was recently carried out with such complete success in the vicinity of Messines.

"The activity of our guns has been so universal that it is difficult to mention any particular action. As a general rule prompt retaliation effectually silences the enemy artillery. Thus on Wednesday in a hot artillery duel in the Ypres neighbourhood our guns had the last word. On the same day, farther to the south, our guns considerably damaged the Ferme du Bois, a German stronghold which figured prominently in the Festubert fighting in May and June.

"On the same day a German aeroplane was shot down and fell in the enemy lines near Westhoek. On Thursday there was great 'gunning' in the vicinity of Boesinghe, on the extreme left of our line, and our artillery very seriously damaged the German trenches. Yesterday our troops carried out some successful bombing operations opposite Hulluch, and our guns immediately quelled a German attempt at artillery retaliation. In the same way the German trench mortars in this region of our front were silenced by our trench mortars. Shelling about ruined Ypres on the same day was stopped by our artillery.

"The air raid on the important German supply depôt at Miraumont (north of Albert) on Tuesday, mentioned in the last official bulletin, was a daring and brilliantly executed piece of airmanship. It was carried out in a high wind, and bombs of heavy calibre were dropped with considerable accuracy from a great height on the buildings, the railway, and the trenches dug about the place to shelter the guards against shell fire and aerial bombs. All our machines returned safely, despite most unfavourable conditions, the wind blowing a regular gale.

"On Thursday afternoon nineteen British aeroplanes attacked the important railway station of Don, where our airmen have done considerable damage in the past, notably during the Neuve Chapelle and Loos operations. Bombs were dropped on the railway station and adjacent buildings, one of the projectiles causing a big explosion, presumably in a magazine. The railway was also hit.

"Several fires were observed to be raging in Don as the raiders drew off, their work accomplished. On the way home four German machines, which came out after the raiders, were successfully beaten off by our aeroplanes. All our machines returned safely.

"Despite unfavourable flying weather there were no fewer than fifteen fights in the air between British and German machines on Sunday and four on Tuesday.

"In one of these encounters a single British machine was 'taken on' by four German aeroplanes at the same time, yet managed to beat off its assailants. The British machine, manned by two airmen, was out chasing away a German Albatros which had ventured over our lines, when the enemy was joined by two Fokker aeroplanes. Our men managed for a time to head the Albatros off from returning to his own lines, and by rising to the same height were able to engage the enemy at very close range with their machine gun. The Albatros was apparently hit, for suddenly it dived steeply to earth, and as it landed was seen to turn completely over. Now two more German aeroplanes joined the two Fokkers, with one of our swift scouts in hot chase. All the four enemy machines now circled round the British aeroplane, firing from their machine guns, but the British airmen kept cool and maintained a steady fire until the enemy gave up the fight and made for home."

The following extract from a letter written by a Flight-Commander on service in France appeared in the *Morning Post* on the 7th inst. :—

"Yesterday I had my first really trying experience. We did a long reconnaissance which took us nearly to Mons, taking us four hours and five minutes. When we left the ground it was freezing hard, and *en route* we encountered two snow storms. The cold was absolutely excruciating, my eyes got frozen up; it sounds absurd, I know, but the water in my eyes turned to ice. I had to keep on brushing it out of my eyes. A great sheet of ice formed over the mouth outlet of my mask so that I had to smash it to breathe. We finished off by fighting a German machine and chasing it from Arras to Douai, where he dived down under cover of his Archies and Horaces. We arrived back, and the pilot, being nearly dead with cold, crashed the machine on landing. Fortunately neither of us was damaged. When we got in we found that they were just preparing to pack our kits, as they thought that we must have been brought down in Germany. I have added one of the propeller-blades of the crashed reconnaissance machine to my collection.

"Sunday Night.

"What a day! I was just getting up at 9 a.m., having had a lazy morning, when a message came down from the office to say that two Huns were on their way to——. I ordered out one of my machines—the one I always go with—and we left the ground to cut them off. When we were over B——, well in our own lines, at about 5,000, we spotted a Hun at about 11,000. We chased it, climbing all the time, till, when just near Lille or about ten miles into the German lines, we got level with it. By this time the German (an Albatros) had been joined by two other Huns. We swept past the Albatros (a big white machine), and I got 40 rounds into it at close range; he banked, then rose, dived to earth, and crashed, apparently turning over. By now the other two machines had turned to engage us, and on turning we found two more coming from over Lille. Four to one—good odds. Fairly long odds; but still we thought we'd have a good smack at it. Rather to our annoyance we saw what we took to be a sixth German—a tiny little single-seater. On they came; they came in line, sweeping past us on the left, round behind our tail, and back on the right. To our surprise the little tiny machine fastened on to the tail of one of the Boches and chased it round and round, and proved to be a little Morane scout. They came on time and time again, pouring machine-gun fire on us, but for every one shot we got they got one back, but at one time we were getting the fire of four machines at once. My hands began to lose all feeling, but I kept the gun going. Bang! bang! came their shots; we could feel the little jars as our machine was hit. But apparently they got more than they gave, as after 25 minutes' fighting two machines cleared off towards Lille and the other two, not liking to be left to fight two British machines (although one was only a little single-seater), flow off southwards. The scout and we at once gave chase to one of them, but had to give up the chase 20 miles further south, and gracefully retired to our own lines to the accompaniment of much Archy."

In a letter written to his friend, the Rev. George Greer, rector of Portaferry, Co. Down, Flight Sub-Lieut. Slade, R.N.A.S., who was captured recently by the Germans, gives the following details of his experience :—

"The German officer's first shot, unluckily for us, hit our petrol tank, and flames burst out behind. Darley, the pilot, shoved her nose down, and the German aviator followed us down, keeping behind and pouring lead into us the whole time. Fortunately, the tank did not explode—I cannot understand why—but went out. Darley had one bullet through his arm, one took the tip of his finger off, another smashed his thumb to smithereens. I amputated it with my penknife. I was untouched, except my clothing. I I could not set our machine on fire, as all the petrol had come out, and my efforts on the wing only ended in the waste of a box of matches. Darley did a stunt landing with only his left hand—extraordinarily plucky, I call it—and saved my life."

A Central News message from Zurich, on Tuesday, stated :—

"A great increase in aerial activity on the part of German aviators is reported in Alsace. They have made repeated efforts to reconnoitre the French positions on that part of the front. It would seem as though Germany contemplated an important offensive there."

### German Aeroplane in Holland.

THE *Telegraaf* reports that a German aeroplane descended during the afternoon of December 1st near Aardenburg, in the Province of Zeeland. The aeroplane was severely damaged and the motor almost destroyed. The two officers in the machine were conveyed to Aardenburg, and will be interned. The aeroplane came from the direction of Bruges.


ALL communications in connection with this section should be addressed to the Model Editor, "FLIGHT," 44, St. Martin's Lane London, W.C. Correspondents are requested to write on one side of the paper only.

## Paper Models.

MR. W. BURROWS writes us the following interesting notes on this subject:—

"Your correspondent, Mr. M. A. Braithwaite, and I seem to have developed paper model gliders upon very similar lines, and in my models I use a rectangular *fuselage* and method of supporting the main planes closely resembling that of Mr. Braithwaite.

"The measurements of all my models have been taken from the scale drawings published in 'FLIGHT,' and successful flights have been made with Avros, Sopwiths, Shorts and Curtiss.

"For the particular design which I find most successful, I have taken the measurements from those of the H. Farman, the upper plane being 6½ ins. span and ⅜ in. chord, and the lower 3¼ in. span by ⅜ in. chord.

"At first the gliding angle was about 1 in 5–6, the planes being flat, but by adding a slight camber the angle was increased to 1 in 7–8, and the stability was materially improved. These two facts were noticed in all four types, but the H. Farman was superior to the others in length of glide and stability. As the Farman model has no dihedral and no stabilizing fin (the rudder is for purely directional purposes), I am convinced its exceptional stability is due to the overhanging top plane. In gusty winds, other models with both planes of equal span, the Sopwith particularly, have frequently capsized, but the Farman has never done so; the wind simply tipping up one wing tip and altering the direction of flight.

"I have also noticed that though good glides can be made with models exactly to scale, the length of such glide can be increased by increasing the length of *fuselage* in front of the main planes. This applies to all types of biplanes, though not to monoplanes.

"With my Farman model the longest indoor flight has been 35 ft. when launched by hand and thrown parallel to the earth (*i.e.*, not *up* in the air), and the longest outdoor flights have been 50 ft. with a following wind and about 20 ft. against it.

"I may state that outdoor flights are far more interesting than indoor ones, as outdoor flights are seldom exactly the same, while indoors a good glider will simply repeat a long glide time after time without any change whatever."

## Lack of Interest in Model Clubs.

Mr. J. V. Winter writes as follows:—

"Having attended one or two meetings of a model club, I have been much impressed by the lack of interest taken in model aeroplanes by the general public. Thinking this over I came to the conclusion that it was due to the fact that the models have but a remote resemblance to full-sized machines. Could not some rules be devised which, while producing interesting competitions, would yet keep the models more or less miniature replicas of the latest aeroplanes?"

## Models at Gamage's Bazaar.

Aeromodellists are well catered for at Gamage's Christmas Bazaar, and those who are interested but cannot make a personal visit to the great emporium in Holborn, should send for a copy of the special catalogue. Complete models can be had in over a score of types, from "flying sticks" for speed enthusiasts to models built more or less on the lines of full-sized machines. A few of them can be obtained with compressed-air motors, while for those who are working on very large models there are two small petrol motors which are well worth attention. One interesting model is designed to loop the loop in most realistic fashion. Apart from the complete models, a full range of parts and accessories are on view, as well as a number of complete sets of parts, any of which would make very acceptable presents to boys; these sets range in price from 2*s.* 6*d.* to 12*s.* 6*d.*, the last-mentioned being for a water-plane. Kite enthusiasts will also find much to engage their attention in the Bazaar, and among the various styles of kites on view not the least interesting is the Japanese Orpheus plane, as it is called, which sings while flying and can be manœuvred and raised or lowered by the manipulation of the cords.

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**"Life is a mirror—smile at it and it will smile back; frown at it and it will frown again.'**

If——.

1900.

WHEN Chloë used to leave her house,
And cabby shouted "Hansom?"
She gave him much. He could not grouse
At what was like a ransom.

1925.

But what will be the pilot's plight
If Chloë, caught by rain,
Should look around for means of flight,
And hear him call out "Plane?"

*H.P.W. in Royal Magazine.*

! !

## Aerodrome Proverbs.

You can lead a 'bus to the aerodrome, but you cannot (always) make it fly.

It's an ill tank that leaks in its own hangar.

The early 'plane catches the Zep.

A fool and his 'bus are soon parted.

Fine socks make fine pilots.

*Brevet* is the soul of IT.

Take care of the fence and the mounds will take care of themselves.

## The Frilly Nightcap Boom.

[ONE result of the Zeppelin raids is said to have been a boom in frilly nightcaps, in order that people may look their best when roused from slumber. A metre from the music hall seems the only one consonant with the dignity of this theme.]—*London Opinion.*

No one looks for Zeppelins down our street;
No one gazes skyward any more.
When our slumber they're molesting, there are things more interesting
As we gather on the pavement as of yore.
Sister Susie's bought a nicky nightcap,
Rakish is the angle on her brow,
And the neighbours, staring at her, feel that airships do not matter.
No one looks for Zeppelins now.

No one heeds the Zeppelins down our street,
Though the searchlights set the sky aglow.
None evinces a desire to look up the least bit higher
Than the forehead of her neighbour down below.
Though a woman here and there may get excited,
The reason isn't German, she'll allow:
'Tis the rival frillinesses that occasion her distresses:
No one heeds the Zeppelins now.

### Destroying a Submarine.

THE following details of the exploit of Flight Sub-Lieut. Viney, R.N.A.S., and the French Lieut de Sinçay in destroying a German submarine off Nieuport, as officially recorded in our last issue, have been given by those concerned in the episode :—

"It happened on Sunday, about noon. We had left at 11.30 in a French biplane on the look-out for submarines. We went up to about 3,000 yards, and west of Nieuport, about five miles from the coast, we sighted two submarines side by side on the surface. The position was very favourable for an attack, owing to the shallow waters. We circled down as fast as possible. The submarines were in an awkward position, as they could not dive, being probably over a sandbank. However, one of them zigzagged, and managed to make away. The other was apparently more difficult to handle, as she never managed to get outside the circles we were making round her.

"When 200 yards from the sea-level we dropped the first bomb, and could plainly see the damage on the submarine's bridge. We continued circling round, and dropped a second bomb with a sure aim. The submarine's back was broken, and she sank.

"We rose again, as by this time enemy aeroplanes might be expected on the sea, but before leaving we ascertained without a doubt that the submarine had been destroyed, as there was a large splash of oil on the surface of the sea."

In the "wireless" news sent out from Berlin last week there was the following :—

"Competent German authorities repeat that no German submarine has been destroyed by a British aeroplane. Papers point out that if the English report is correct either a British or a French submarine has been destroyed."

### Carpentier Decorated.

IT was announced in Paris last week that M. Georges Carpentier, the boxer, had been awarded the Croix de Guerre with palms. The official description of his work reads : "Sergeant Carpentier (Georges), pilot in the air squadron, M.F. 55. On September 25th did not hesitate to fly in fog and rain less than 600 feet above the enemy's lines during action. In several circumstances he has given proof of remarkable coolness and energy, never returning before the completion of his mission, often with his machine riddled with bullets and shell fragments."

### A Fatal Accident in France.

A MESSAGE from Pau on Monday stated that Sub-Flight-Lieutenant Verines had fallen 800 feet while flying, and sustained injuries which proved fatal.

### The Wrecked Zeppelin "Z 18."

IN a message from Copenhagen on December 6th Reuter's special correspondent said, "The aluminium framework, which was all that remained of the 'Z 18,' has been melted down and sent from Tondern to Friedrichshaven. Another Zeppelin, a smaller and older type, has taken its place, assisted by several hydroplanes, of which one is reported to be missing since last Tuesday, after a trip along the coasts of the islands of Manoe and Fanoe.

"The 'Z 18' is described as being the largest and costliest airship of the whole fleet. A number of people along the west coast who saw the airship on her first and last trip on November 15th, say that the type differed considerably from the usual one, the vessel being round at either end, instead of pointed, and the envelope being comparatively broader, while the gondola was built flush with he envelope. She was less visible than the earlier models."

### Germany's New Giant Machines.

INTERVIEWED in Denmark on his return from a tour of German aeroplane factories, the Swedish aviator Baron Cederstroem is reported to have stated that German builders are devoting their energies to the construction of heavy armoured biplanes, capable of carrying large loads of guns, wireless apparatus, petrol, and bombs for long journeys. The baron said he had made a trip in a newly-finished giant battle aeroplane, but he declined to give details of the construction except that it had nothing in common with the Sikorsky machine.

It was simply a biplane nearly three times the size of the ordinary Albatros, with proportionately broader planes and immense horse-power, and carrying a large crew. The engines made a terrific noise, but the aeroplane flew without a hitch, the steering being conducted by a pilot on a structure resembling the bridge of a steamer.

### German Flying Officer Escapes from Holland.

ACCORDING to a message received by the *Handelsblad* from Alkmaar, two German officers have escaped from the internment camp there. One of them was the pilot of the aeroplane which recently landed in the Frisian Islands.

### Congratulations.

AT the Church of the Assumption, Warwick Street, W., on Thursday, Flight-Commander S. V. Sippe, R.N.A.S., was married to Miss Mabel D'Arcy, the bride being given away by Lord Athlumney. Congratulations.

### Austrian Engineers and Sir William Ramsay.

ACCORDING to a message from Zurich, after a long and heated discussion, the Austrian Society of Engineers and Architects has expunged the name of Sir William Ramsay from the list of its corresponding members. A fourth of those present voted against the motion, and urged that action in the matter should be postponed.

### Osram Lamps are British.

THE large response of the electrical industry to the call for recruits has resulted in difficulties for the lamp manufacturer, as well as for other departments of electrical enterprise. At the same time, the war has created many special demands for lamps, and so encouraged makers in maintaining the standard of technical progress and productive efficiency. At the Osram-Robertson Lamp Works (Hammersmith, London, W.), for instance, a steady improvement is recorded in all the qualities which go to make a satisfactory lamp, and Osram drawn-wire lamps now are even more efficient than formerly and the initial candle power is maintained for a lengthened period. These achievements are all the more satisfactory inasmuch as every part of the Osram drawn-wire lamp is produced in this country. Even the raw materials are drawn from British sources. The bulbs are produced in Great Britain ; and at Hammersmith every process of manufacture is carried out by British workpeople, from the treatment of the Tungsten ore to the finished filament, and including the making of the supports, hooks, caps and other details.

### An Almanac and the Red Cross.

A PERFECTLY charming almanac for 1916 is just published by Messrs. Abdulla and Co., the famous cigarette house of New Bond Street, 20,000 copies of which have been given by the firm for sale for the benefit of the funds of the British Red Cross Society. The anticipated £1,000 from this source should easily be reached, as the dozen reproductions of pictures by such well-known artists as the following : Messrs. J. Shaw Crompton, Frank Dadd, R.I., Charles Dixon, Tristram Ellis, Maurice Grieffenhagen, W. Hatherell, A. S. Hartrick, A.R.W.S., Arthur Hopkins, William Logsdail, Frank A. Mason, Frank Reynolds, R.I., and W. J. Wainwright, R.W.S., should ensure a ready sale for the almanac. Each picture is a work of art, and nobody could grudge the added advertisement which the publishing firm get for their cigarettes in return for the enterprise in producing such a charming guide for the months of 1916.

## PUBLICATIONS RECEIVED.

*"Wellcome" Photographic Exposure Record and Diary*, 1916. Burroughs Wellcome and Co., Snow Hill Buildings, London, E.C.

*The "Abdulla" Almanac*, 1916. Abdulla and Co., Ltd., Cigarette Specialists, 168, New Bond Street, London, W.

**Catalogue.**

*Gamage's Christmas Bazaar.* A. W. Gamage, Ltd., Holborn, E.C.

## Aeronautical Patents Published.

**Applied for in 1914.**

*Published December 9th*, 1915.

7,660. W. RITTBERGER. Flying machines.
9,177. I. BELL. Aerial machines and aerial-driven watercraft.
12,574. I. BELL. Aerial machines.

**Applied for in 1915.**

*Published December 9th*, 1915.

4,543. I. BELL. Aerial machines and aerial-driven watercraft.


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